

In This Issue—25 Years Ago in Motor Age

MOTOR AGE

Vol. XLVI
Number 11

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CHICAGO, SEPTEMBER 11, 1924

Thirty-five Cents a Copy
Three Dollars a Year



Blue Box Line
for all cars ex-
cept Ford

Greater Profit and Greater Service

The dealer who urges car owners to install new Champions by the full set makes a greater profit and he renders a real service to the motorist.

Champion engineers have proved, and other leading automotive engineers also, that it is real economy to install a complete set of new spark plugs in a motor car at least once each year.

They will actually pay for themselves many times over, to say nothing of the much better all around performance they make certain.

So you are actually doing the car owner a great service when you urge him to change his spark plugs at regular intervals. You are saving him money and you are making a good business friend.

And you are also making a much greater profit for yourself.

Champion produced two-thirds of all the spark plugs made last year. Yet dealers could multiply their sales and profits three times by urging a regular replacement of plugs.

With your co-operation it is possible to make the economical procedure of changing spark plugs regularly an almost universal practice.

This would mean more money for you and much better satisfied car owners.

So urge your customers to install dependable Champions by the full set. Show them why it is real economy for them to do so.



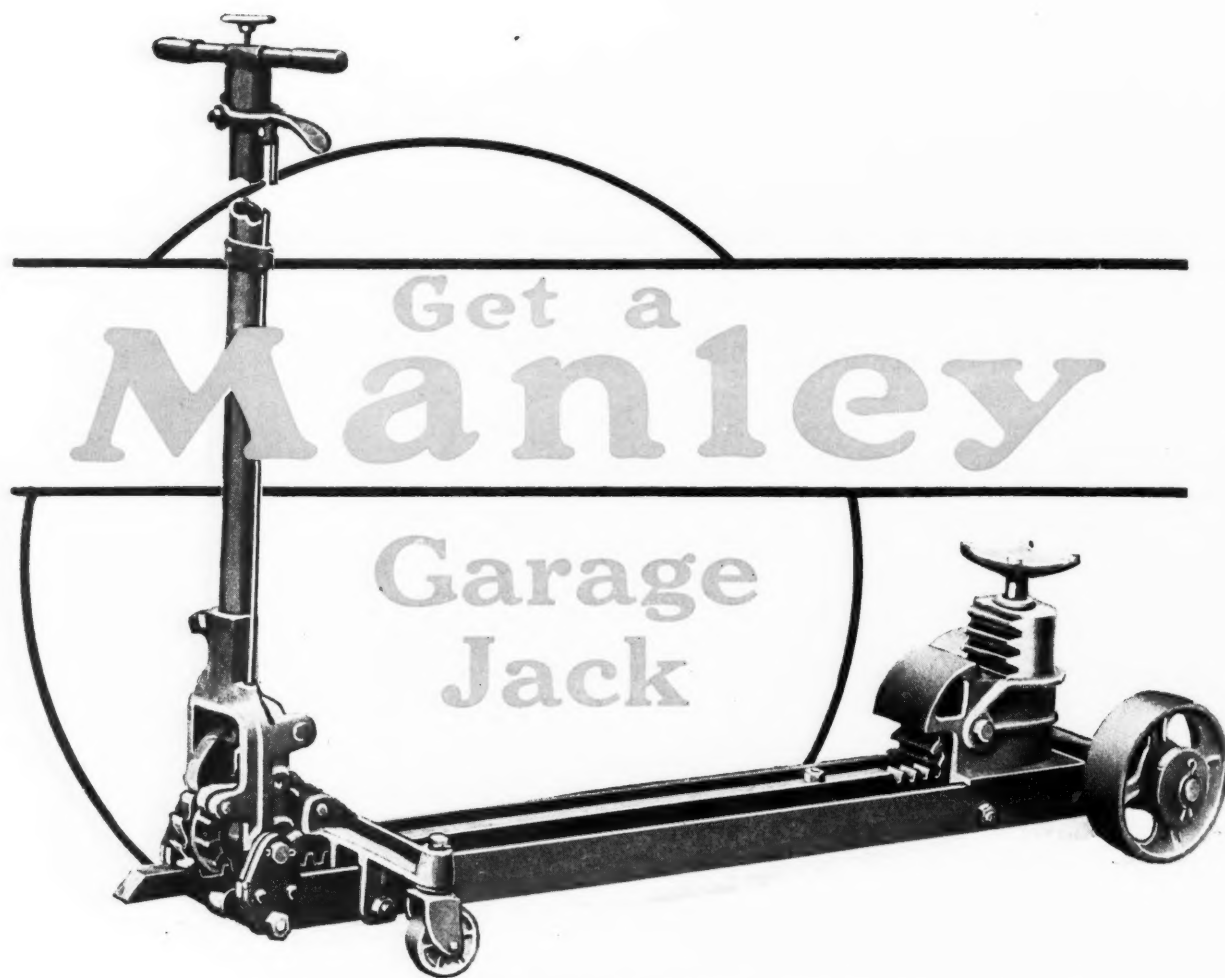
Champion X
for Fords

Champion Spark Plug Company, Toledo, Ohio

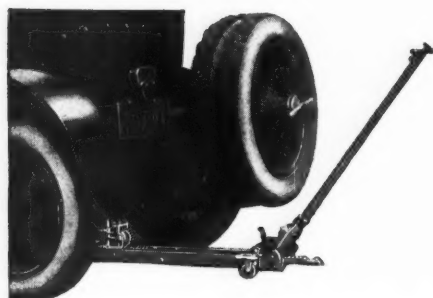
Champion Spark Plug Company of Canada, Limited, Windsor, Ontario

CHAMPION

Dependable for Every Engine



Get a Manley Garage Jack



"Only a Jack which can be operated with long or short strokes could be used under the differential of this car."



The MANLEY JACK which has proven so popular among garagemen has been further improved, the housing which carries the post now being one big strong casting instead of two pieces bolted together. The post itself is now cylindrical in shape with the gear teeth integral, and is prevented from turning by a flat the entire length of the post opposite the teeth. The method of supporting the casters has been improved by using a drop forged yoke.

The MANLEY JACK has long been one of the most practical jacks on the market, but all MANLEY EQUIPMENT is being improved constantly.

THE PRICE OF THE MANLEY JACK REMAINS THE SAME.—\$36.

Of course it retains all the features which have made it a universal favorite—

It can be operated notch by notch, so that the jack may be used in close quarters or under overhanging bodies.

The pressure required to operate it is uniform from beginning to end of the stroke.

It is correct mechanically and like all Manley equipment has a tremendous factor of safety. In other words, it is unusually strong and rugged and can be depended upon under all conditions.

It can be supplied with a minimum clearance of either $6\frac{1}{4}$ " and travel of $4\frac{1}{4}$ " or minimum clearance of $7\frac{3}{4}$ " and travel of $5\frac{1}{4}$ ".

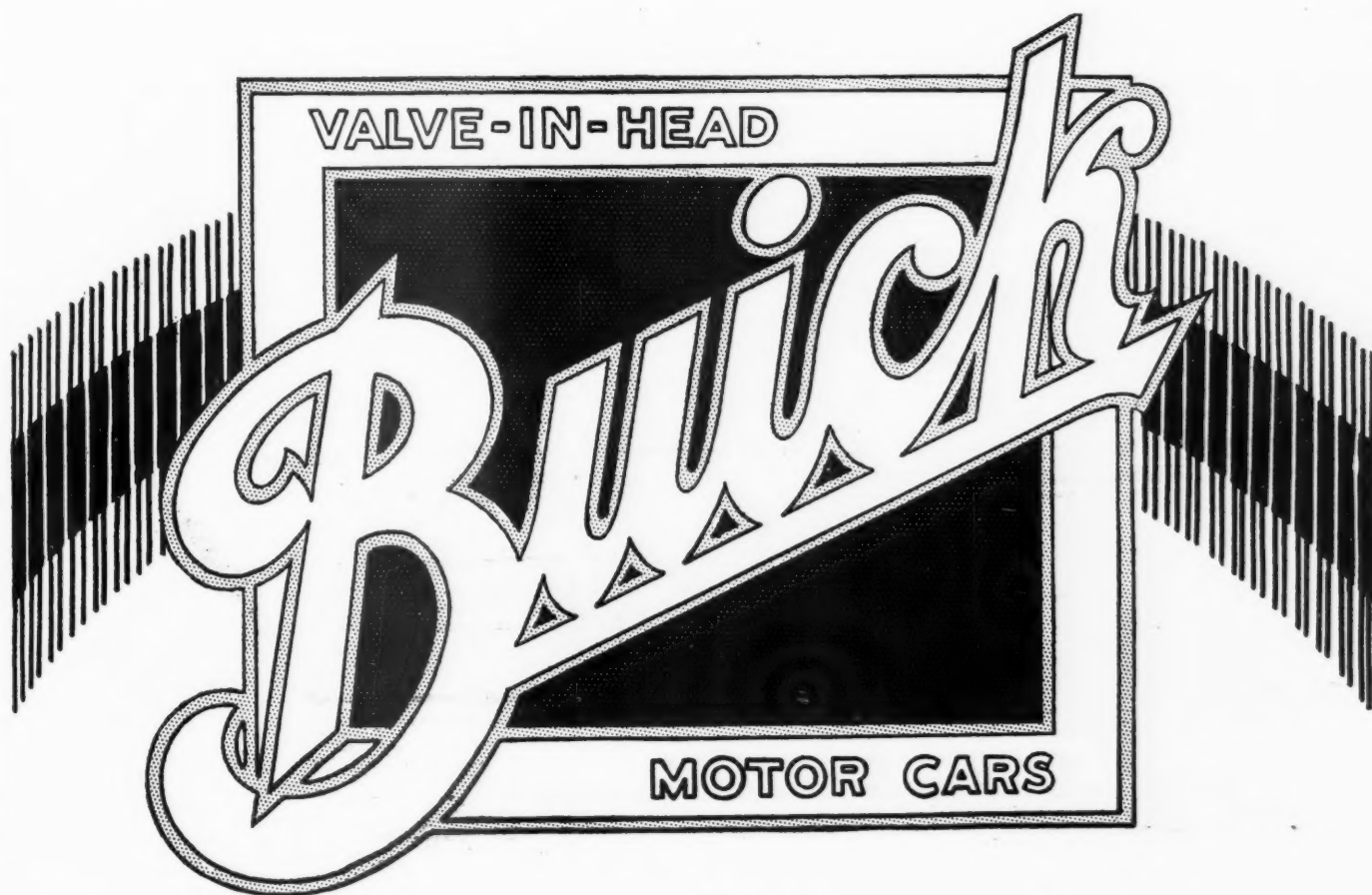
The price is the same for either type. Merely specify "High Type" or "Low Type".

It can be supplied with rubber tires at \$11 extra.

You can secure from your own jobber.

Write us for special bulletin.

Manley Mfg. Co., York, Pa.



The 23 New Buick Models
at prices that make them
the greatest motor car values ever offered—
give to the Buick dealers
the greatest motor car selling
opportunities ever offered.
Why not have *your* name on file?

BUICK MOTOR COMPANY, FLINT, MICHIGAN
Division of General Motors Corporation

Pioneer Builders of Valve-in-Head Motor Cars

Branches in All Principal Cities—Dealers Everywhere

**WHEN BETTER AUTOMOBILES ARE BUILT,
BUICK WILL BUILD THEM.**



This Plan Has Helped Thousands of Garage Men

If you could meet the thousands of successful garage men and car dealers who use the Burroughs Simplified Accounting Plan—if you could hear each one tell how it helped his business and increased his profits—you wouldn't hesitate a minute. You would want it right away.

The Burroughs Simplified Accounting Plan is a complete bookkeeping system but without any red tape. This plan quickly detects poor paying departments, shows you where the leaks and losses are and how to prevent them. It pictures every detail of your business daily. Yet, it is so simple that anyone can do the work, and it takes no more time than slow, inaccurate pen and ink methods.

It tells you *each day* how much is owed to you—how much you owe—what your expenses are—how much money you have on hand—the value of the stock on hand and all the other facts that you should have at your finger tips daily.

Let a Burroughs man explain this plan to you in detail, and show you how it will help you make more money. If you live in one of the more than 200 cities where there is a Burroughs office, call on the telephone. Your banker or your phonebook will give you the address, or if more convenient, mail the coupon and we will send you full information.

Burroughs Adding Machine Company
6139 Second Blvd.
Detroit, Michigan

Without assuming any obligation I would like further information about the Burroughs Simplified Accounting Plan.

Name _____

Business _____

Address _____

Burroughs

Adding



Machines

Bookkeeping



Machines

**BETTER
FIGURES
MAKE
BIGGER
PROFITS**

Calculating



Machines

Billing



Machines

MOTOR AGE

Reg. U. S. Pat. Office

Vol. XLVI

No. 11

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Subscriptions accepted only from the Automotive Trade
 Entered as Second Class Matter Sept. 19, 1899, at the Post Office
 at Chicago, Ill., under Act of March 6, 1879.

Gets Tourist Business!

"We are well pleased with the Goodrich line and handle it exclusively."

Silvertowns give wonderful service and in our opinion meet with the least sales resistance of any standard make. Once we sell a customer a Silvertown we look for repeat business and we get it! We also enjoy a large tourist business. People ask for Silvertowns and insist on getting them. Our profits are most gratifying."

W. H. LIMP & SON
 Petersburg, Indiana

BUILD WITH GOODRICH
 for PERMANENCY

THE B. F. GOODRICH RUBBER CO.

Akron, Ohio

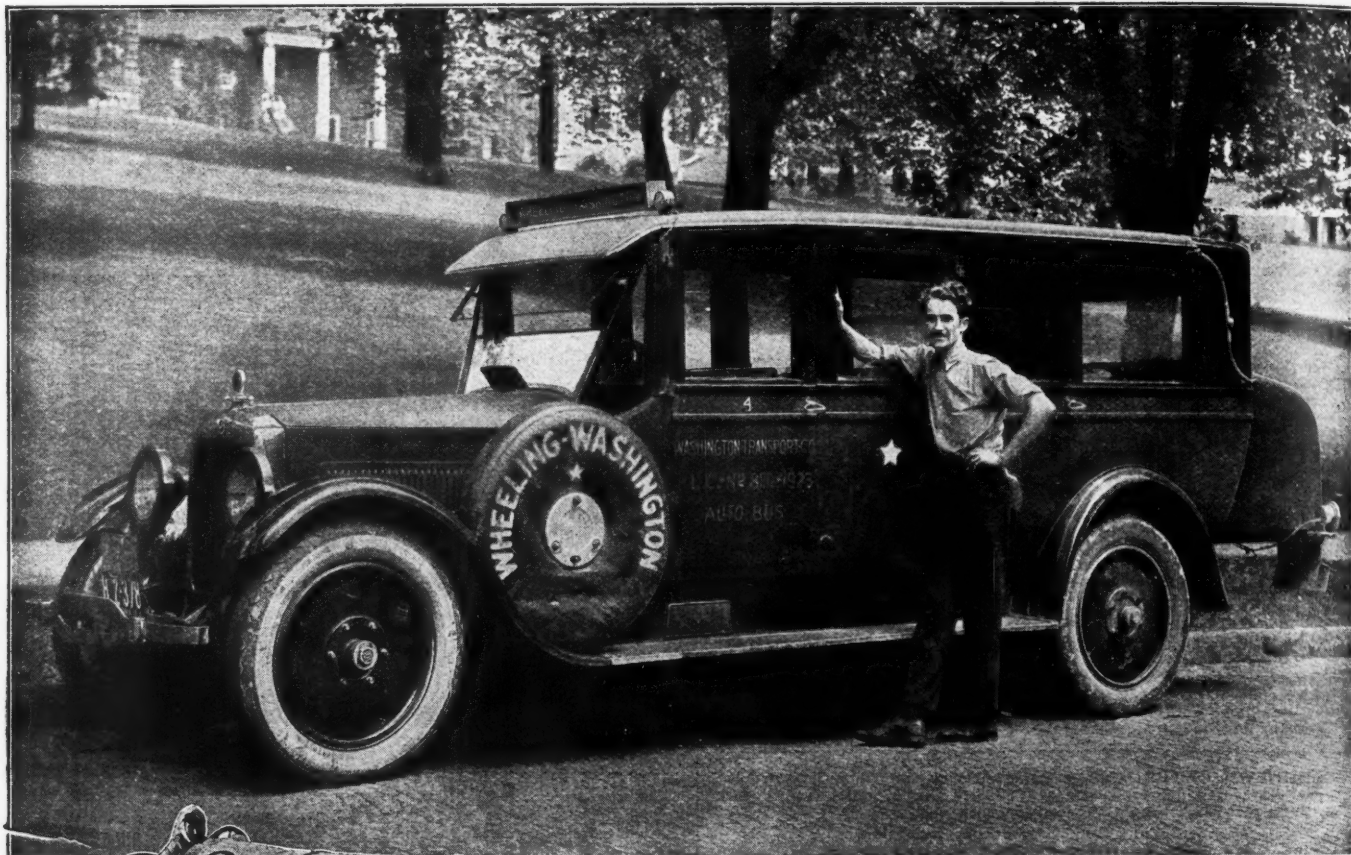
ESTABLISHED 1870

Goodrich

TIRES

"Best in the Long Run"





N. P. ("Red") Fetterman, well-known racing driver, Service Manager of the Washington Transportation Co.

After ten weeks of constant service, the Multibestos Taxitrux brake linings of this cross-country bus showed practically no wear.

"Practically no wear after 12,000 miles"

—Experience of Washington Transportation Company

Washington, Pa., July 23, 1924

AS a result of the excellent service referred to in this letter, the Washington Transportation Company has standardized on Taxitrux and is installing it on their entire fleet of twelve busses.

But the experience of his company is not unusual. Owners of trucks, taxis, single and in fleets, in all parts of the country are discovering the remarkable service which Taxitrux always provides. Taxitrux, because built especially for use on heavy duty vehicles, contains a larger amount of yarn and is finished to resist moisture, oil and grit.

Taxitrux meets every problem of the commercial vehicle user. Perhaps the most important problem solved is the saving of time now lost in layups for brake relining and adjustment. May we send you some simple figures showing these savings?

"We operate a fleet of busses between Washington, Pa. and Wheeling, W. Va., over roads which pass through a very mountainous country with many steep grades to negotiate. . . . Before using Multibestos Taxitrux Brake Lining we had used practically every other brand and type of lining with varying results. The best record we had secured in length of service was thirty days, and in this case we were compelled to adjust the brakes every six days.

"The first set of Taxitrux lined bands were installed on a set of old drums on May 13th, just ten weeks ago today, and though this bus has been in constant operation, averaging 1200 miles a week, we have adjusted the brakes twice and the lining shows practically no wear after 12,000 miles of service. The remarkable response of Taxitrux gives our drivers added confidence in rendering rapid and safe service to our patrons."

WASHINGTON TRANSPORTATION COMPANY,
N. P. Fetterman, Service Manager

MULTIBESTOS COMPANY, Dept. M.A. 9 WALPOLE, MASS., U.S.A.

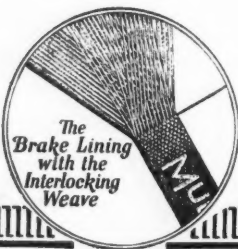
NEW YORK
105 West 63rd Street

DETROIT
930 Taylor Avenue

CHICAGO
1241 Michigan Avenue

NASHVILLE
1200 Broadway

EXPORT OFFICE—461 Eighth Avenue, New York



MULTIBESTOS

"TAXITRUX"

BRAKE LINING FOR CABS, BUSES, TRUCKS

15 new STUDEBAKERS

Including an entirely new type of car
... THE DUPLEX-PHAETON!

In these new models STUDEBAKER
has made automobile history, and has
established standards of value and
quality more fully and obviously than
ever before!

Three completely new chassis! Fifteen
completely new bodies! Completely new
lines! Completely new *open-closed* car!

Completely new radiators, new fenders,
new lamps, new seating-comfort, new
finish, new colors, new unit power plant!

Real balloon tires—not low-pressure
cords! New Studebaker Hydraulic
4-wheel brakes—optional!

New *values*—never before equaled!

*Full details—of vital interest to every motor car dealer in
America—in public announcement, all newspapers,
Sunday, September 14th! See it!*

THE STUDEBAKER CORPORATION OF AMERICA, South Bend, Indiana

T H I S I S A S T U D E B A K E R Y E A R



NASH

Nash Leads the World in Motor Car Value

*Here's the New
Special Six Touring*



\$1095

f. o. b. Factory

*Nowhere Else a Six Like This
for the Money*

The vigorously growing demand for a quality Six at close to \$1000 prompted C. W. Nash to create the model above.

And it stands out head and shoulders above its field as a motor car value.

No dealer can look once at it and not become enthusiastic over it.

Like all the other Special Six series, as well as the Advanced Six models, this car has the special design Nash four-wheel brakes; full balloon tires; five disc wheels; strikingly developed performance; new steering mechanism; and a score of other sales features that are piling up orders for it.

Never in Nash history has there been anything like the widespread, insistent demand that sprung up almost overnight with the introduction of these two entirely new series of Sixes.

There's no secret about it—everyone knows Nash dealers are getting the business. You can, too, if you act quickly and land a Nash contract. Write us today.

Prices and models are as follows: SPECIAL SIX Series: 5-Pass. Touring, \$1095; Roadster, \$1095; 5-Pass. Sedan, \$1295; f. o. b. Milwaukee. ADVANCED SIX Series: 5-Pass. Touring, \$1375; 7-Pass. Touring, \$1525; Roadster, \$1375; 5-Pass. Sedan, \$1695; 4-Door Coupe, \$2190; 7-Pass. Sedan, \$2290; f. o. b. Kenosha.

THE NASH MOTORS COMPANY, KENOSHA, WISCONSIN

(551)

**EVERY
RAMCO A
PERFECT CIRCLE**
Made to Fit the Piston

RAMCO Cushion Inner Rings are absolutely round when fitted behind the piston ring. Each ring is made accurately in size, width, thickness and number of crimps to fit the piston for which it is intended.

These are a few of the reasons why it is almost impossible for the dealer to cut his own inner rings. The variance of a few thousandths of an inch may cause uneven tension, too much tension, or sticking in the groove.

Sell Ramco Cushion Inner Rings with every piston ring and double the piston ring profits.

Order direct, specifying Jobber

RAMCO
Cushion
INNER RINGS

Ramsey Accessories Manufacturing Corporation
St. Louis, Mo.

The Good MAXWELL

Proof of Growth

Every month brings new proof of Maxwell-Chrysler growth.

Just recently, for example, R. H. Collins became Maxwell-Chrysler distributor in Chicago, Walter F. Wright in Cleveland, Guy O. Simons in Brooklyn and Long Island, L. E. Frey in Altoona, Pa.

These men, and others like them, are not swayed by argument or sales cleverness; they pick and choose on the basis of facts, and in the light of cold reason.

Their experience covers years of successful operations. They know too well the importance and power of public opinion to undertake to sell cars in which the public is not actively interested.

Over and over again they heard men speak of Maxwell-Chrysler as the big comers.

In checking the facts they found Maxwell-Chrysler to offer them greater opportunities for the future and greater profits now than any other single group in the world.



They found the good Maxwell steadily increasing its leadership in the field of fours—found indeed that in this field the good Maxwell was every whit as great and popular as the epoch-making Chrysler in the field of sixes.

In the light of these facts, then, what more natural than for them to seek a chance to join forces with Maxwell-Chrysler and share in the success which is inevitable?

Why shouldn't you follow their example and take steps now to get in on Maxwell-Chrysler profits?

Write or wire for details now.

MAXWELL MOTOR SALES CORPORATION, DETROIT, MICHIGAN
CHRYSLER MOTOR CORPORATION, DETROIT, MICHIGAN
MAXWELL-CHRYSLER MOTOR COMPANY OF CANADA, LTD. WINDSOR, ONT.

The Chrysler Six

MOTOR AGE



A Christmas suggestion from
A. D. Roper Motor Co., Phoenix, Ariz.

When Christmas Comes

Will You Get Your Share of the Money That Will Be Expended for Holiday Gifts?—Automotive Merchandise and Maintenance Solve the Giving Problem

By SAM SHELTON

THE automotive merchant who begins now to make definite plans for an active Christmas selling season will enjoy the good fortune of counting up profits along about Dec. 26.

It has been demonstrated that automotive merchandise can be sold to an increasing army of holiday shoppers. The great variety of products available for the users of automobiles opens wide a merchandising opportunity that progressive dealers have not been slow to grasp. Useful and attractive equipment for automobiles has a definite appeal that makes this line of goods especially acceptable as Christmas gifts.

For a long time automobiles have been considered the

Christmas gift supreme. The prosperous business man has rewarded his wife with a car for her own personal use. Or the family has pooled its Christmas money and purchased its first car or a new one to take the place of the old one. The Christmas season will continue to be a good time for the sale of cars, but this field naturally is limited. There is a much broader field for the enterprising automotive merchant to sell accessories and equipment to the millions of relatives of satisfied car owners in order to make the owners more satisfied.

The idea of giving automotive gifts for Christmas is being aggressively and nationally promoted by the Automotive Equipment Association through its merchandising



This window won a prize in the A. E. A. Christmas contest last year. It is that of Claude Nolan, Savannah, Ga.

department. The success that accompanied last year's Christmas campaign demonstrated the possibilities that are awaiting development.

In preparation for the coming holiday season Arthur R. Mogge, merchandising director of the A. E. A., has announced a repetition of last year's Christmas window trimming contest for dealers. This contest is open to all car dealers, accessory dealers, garagemen, or others engaged in the retail sale of automotive equipment or service. Prizes totaling \$500 will be awarded to the 15 winners. The purpose of the contest, of course, is to promote the sale of automotive merchandise and in that respect the enterprise should be highly profitable to those who participate, but the capital prizes are large enough to make them worth striving for. The first prize is \$150; second prize, \$100; third prize, \$75; fourth prize, \$50; fifth prize, \$25; and 10 prizes of \$10 each. Conditions of the contest have already been published in *MOTOR AGE*.

Many manufacturers who are members of the Automotive Equipment Association already have signified that they will this year pack one or more items in Christmas packages or wrappers. Most of them also will do extensive advertising. Many of them will provide the dealer with special holiday literature for distribution among his customers. The Merchandising Committee of the A. E. A.

will provide attractive window streamers, cards and counter displays for distribution through automatic jobbers. On the whole the Christmas effort this year will be so widespread and effective that the dealer can ill afford not to participate in it.

What should be the dealer's course of action from now on in order to reap the greatest profit from the holiday campaign?

He should begin to make his plans early—right now if not already made.

He should tie up his local effort with the A. E. A. campaign.

He should co-operate with those manufacturers and jobbers who are spending their own money to help increase his sales.

Then he should do these other things:

1. Select articles to feature as Christmas gifts.

2. Decide upon source of supply.

3. Arrange stocks and dress windows.

4. Begin advertising.

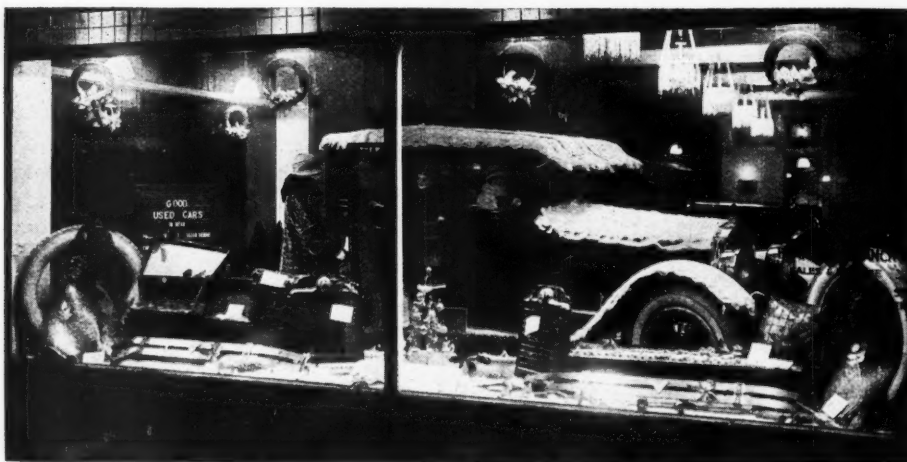
Selection of articles to feature as Christmas gifts is the first phase of the dealer's enterprise after he has determined to join in the Christmas campaign. Almost any article that can be attached to or used in connection with an automobile is acceptable as a Christmas gift, but the dealers will find that some articles are more adaptable for this purpose than others. The type of car predominating in his community will have considerable influence on the tastes of his customers. It would be advisable, therefore, first to survey the community and determine the relative number of cars by price classes and also by open or enclosed type.

Accessories Profitable Field

The result of this survey should guide the dealer in his selection and stocking of merchandise for Christmas sale. For instance, in the low price field there are certain accessories almost necessary to complete the equipment of the car. If they have not been installed at time of sale of the car it should be an easy matter to sell them at Christmas time. Owners in the medium price class usually are good buyers of accessories. Prices do not seem quite so big to them and they are more inclined to desire complete equipment. In the high price class so many of the cars are equipped to the last word that the market for additional accessories is limited.

Knowing something about the types of cars in his territory and the buying characteristics of his prospective customers, the dealer should get out his catalogs and run through the list of accessories and equipment. He can very easily single out certain items that will most readily adapt themselves to Christmas gift merchandising in his community. The list should be as complete as possible, although the stock of some items might be very small. The idea is to give the customers the widest practicable range of selection.

The next step is to decide upon the



The car itself is the background for this Christmas window in which useful accessories are shown. This window is that of the Evanston branch of the Packard Motor Car Co. of Chicago

source of supply and arrange for the necessary stocks. It is wise to buy from a reputable established source—one that can be depended upon to give prompt service and deal fairly. The goods should be of standard make and quality, salable at any time of the year. This is the time of all times to beware of the gaudy, cheap article that depends upon the glamour of Christmas to move it from the shelves at a price that is dear no matter how low. Where Christmas boxes are used it would be well to see that they are of the slip-on type used to cover the regular carton in which the article is packed. Then if any of the stock is carried over the holiday the outer covering can be removed and the goods placed in regular stock.

A survey made by the merchandising department of the A. E. A. shows that many of the manufacturers are now ready to ship their Christmas merchandise. Others will be ready in October. The jobbers, of course, will get their supplies as early as possible and be prepared to fill dealers' orders immediately.

When the dealer's stocks of holiday goods begin to arrive he should arrange them in the most accessible place. His salesmen must not be permitted to overlook the fact that they have a stock of Christmas merchandise to be moved while the moving is good. The goods should be where the customer can see them. And of course windows will be trimmed several weeks in advance of the holiday so as to very strongly draw attention to the fact that automotive articles make good Christmas gifts. The A. E. A. slogan will be, "Give Something for the Car This Christmas." It is a good slogan and one the dealer can well afford to make use of in his advertising.

Local advertising should begin early so as to tie in with national advertising that will be done by manufacturers and the promotion work of the A. E. A. Merchandising meetings will be held in many cities by representatives of the A. E. A. or by jobbers, and it will be worth while for dealers and salesmen to attend these meetings. The ideas and suggestions put forth at these meetings will give inspiration and information for sales campaigns that will bring results.

It Pays to Advertise

The dealer who wants to make the most out of the Christmas campaign will find it advisable to advertise in his local newspapers, in the movie theaters and through the distribution of literature and printed matter to his customers. The desirability and utility of automotive gifts should be emphasized in all advertising copy. Many dealers have found it profitable to distribute suggestion lists naming articles that would be suitable as gifts for various members of the family and giving the prices. These lists should cover a wide range of prices.

Christmas sales of the automotive merchant need not be confined to accessories and equipment. The dealer who sells cars knows that the Christmas time is one of his best selling season. Many dealers can make it an even better selling period that it has been. Well directed sales effort should be able to convince many persons that money put into a new car for the family, or an individual car for wife or daughter, would give more genuine pleasure than the same amount paid out for any other possible gift.

The sale of cars need not be confined to new cars. A



Many Christmas gift suggestions were shown in this window used last Christmas season in the store of Thomas Plemby, Ltd., Victoria, B. C. This was another A. E. A. prize winner

good used car is often an acceptable Christmas gift for a family that cannot afford a new car of the type desired. The dealer who hopes to sell used cars for Christmas gifts, however, should be sure that they are made to appear attractive. A used car refinished and touched up with some attractive accessories might sell when there would be no possible opportunity to dispose of an "as is" vehicle. Cars that the dealer expects to dispose of in this way should be fixed up in advance of showing. Human imagination cannot very well picture an old car made attractive.

It is possible for the maintenance man to sell his services for presentation as a Christmas gift. If the family car needs a general overhaul the Christmas money might be pooled for that purpose. Or Mother might decide to present Dad with a certificate entitling him to the carbon cleaning and valve grinding job that he has been fussing about so long. The maintenance shop that operates on a flat rate basis is especially well equipped to offer repair jobs as Christmas gifts. It is possible to list certain frequent operations, quote the price and offer to sell certificates entitling the holder to performance of the specified job. Such certificates should be appropriately printed in holiday colors and design, and serially numbered. A record should be kept of the numbers of certificates sold. The name of the particular operation for which the certificate was issued could be neatly lettered in.

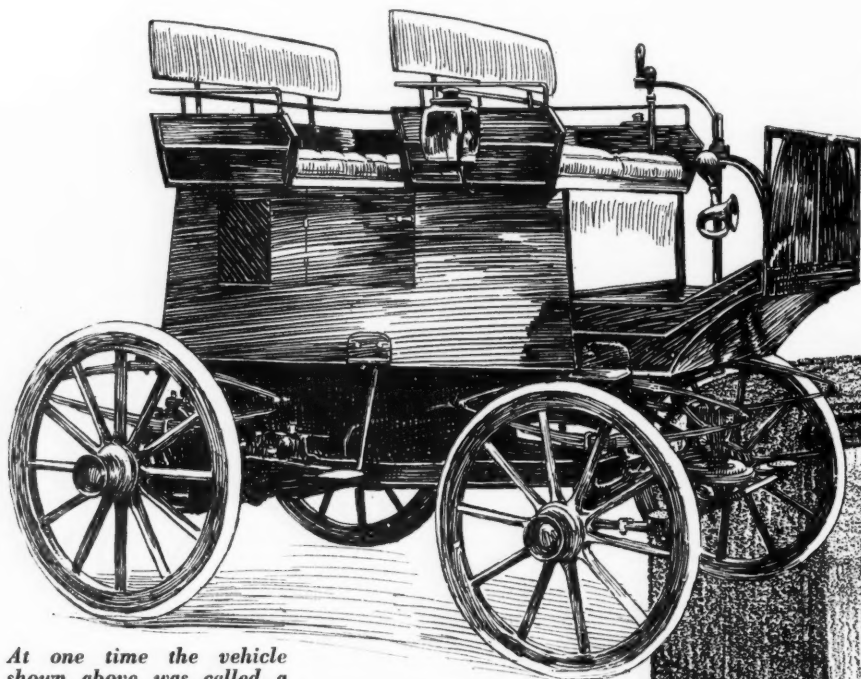
Installation a Profit Medium

When articles not easily installed by the car owner are sold for Christmas gifts the price should include installation to be effected, of course, immediately after Christmas. Some accessories are nationally advertised at a price which includes installation. But if the nationally advertised price does not provide for the installation charge the dealer should add enough to cover this charge and explain in his advertising and otherwise that all accessories and equipment sold as Christmas gifts are to be installed by him without additional charge.

By beginning now and following aggressively through the season the automotive merchant should be able to account for a handsome profit in the last two months of the year. That would give him courage and cheer for the beginning of the new year.

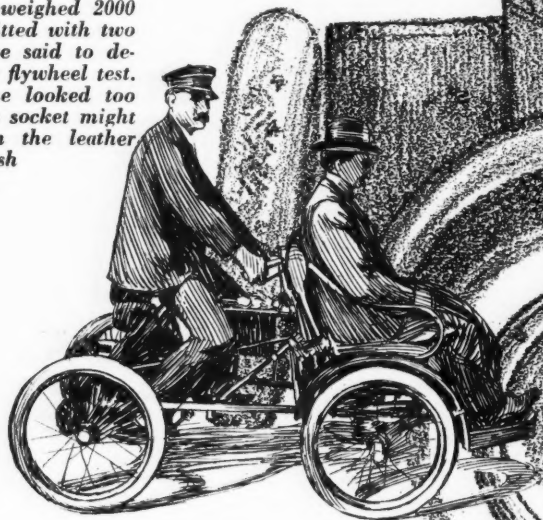
(Additional articles on the possibilities of Christmas sales by the automotive dealer will appear in subsequent issues of MOTOR AGE.)

Our Industry Is a Quarter-Century Old—The



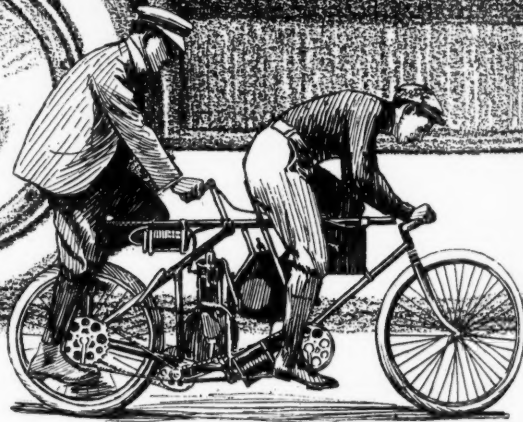
Times have changed in the last quarter-century. The industry has gone forward. Study the pictures on this page in contrast with modern designs and you will be convinced that the motor vehicle has scored its evolution in a remarkably short time

At one time the vehicle shown above was called a new style in gasoline motor carriages. It weighed 2000 lbs. and was fitted with two cylinder engine said to develop 7 hp. by flywheel test. Perhaps if one looked too closely a whip socket might be located on the leather dash



The Orient four-wheeler in which the lap robe for the occupant of the front seat played a major part. In building these cars no chances were overlooked, it was

said, and workmen were given an exceptional chance to develop valuable ideas at the company's expense



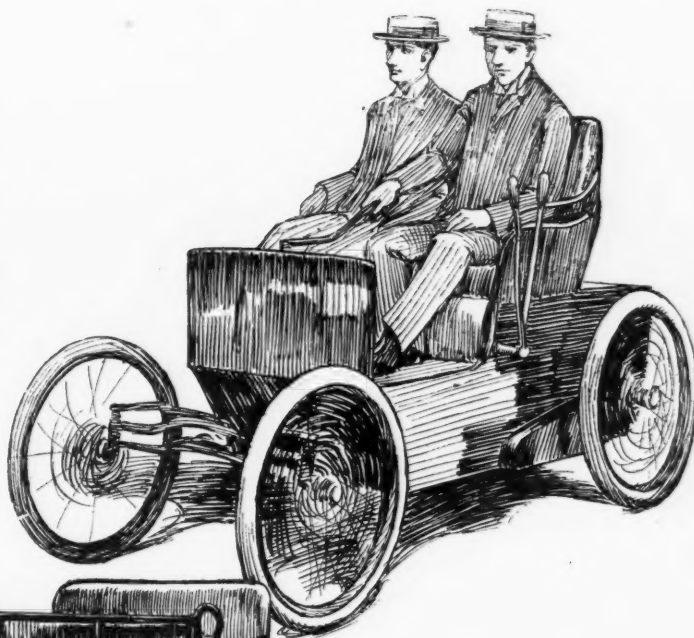
Do you remember way back when this sort of rig burned up the roads? This tandem was built by the Waltham Manufacturing Co. A single cylinder engine was the motive power and one of the items stressed was that a muffler was fitted so the engine ran silently. They didn't make motor cycles for speed cops in those days either

The Orient steam wagon which made its appearance in the latter part of the nineteenth century. About all you had to do with this vehicle, assuming of course, that there was plenty of steam, was to hold the "guider" in the center and let her go. In the descriptive literature concerning this vehicle it stated that the car proved itself a docile instrument in the driver's hands

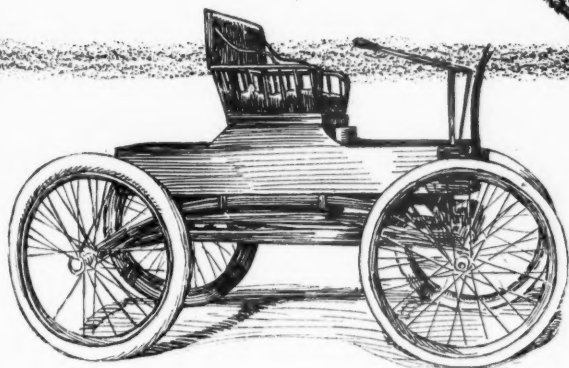
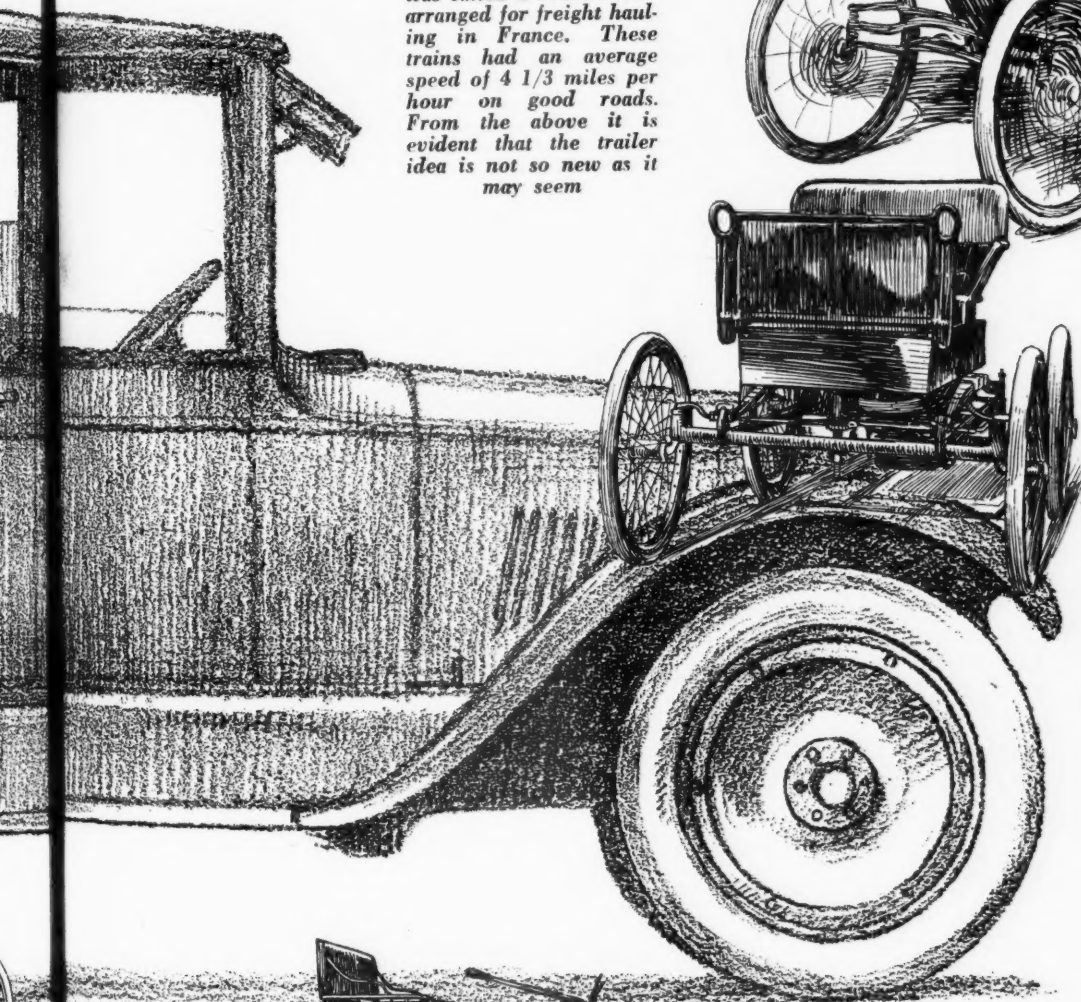
These Designs Were Built 25 Years Ago



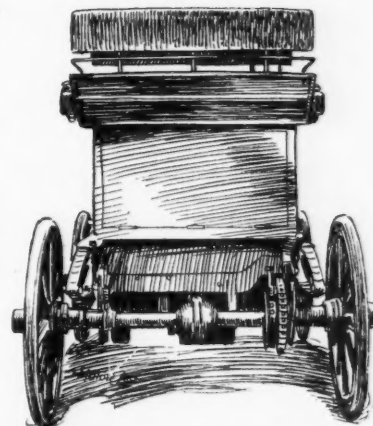
Above is shown what was called a Train Scotte arranged for freight hauling in France. These trains had an average speed of $4 \frac{1}{3}$ miles per hour on good roads. From the above it is evident that the trailer idea is not so new as it may seem



The two vehicles here comprise the Marsh Brothers steam wagon, upper view, and the car built by two men who organized a company in Syracuse, N. Y. Their intentions were to make both electric and gasoline driven cars. In these cars the offspring of the bicycle wheel is clearly shown. It also was hard to get away from the buggy type of body



At the right is shown what was called the Holyoke Park Trap. This is a view of the car and shows the chain-driven rear axle. The springs were of the full elliptic type supplemented with coil springs the latter called "emergency springs". The other car is another view of the car shown at the top of this page



The Drill Press an All-Purpose Tool

Market Affords Great Variety of Upright Drilling Machines. The Most Economical Press to Buy. Individual Motor Driven Versus Line Shafting Drive. Some of the Uses of the Drill Press in the Automotive Shop

By B. M. IKERT

(The third article of a series on shop tools. Others were printed in the Aug. 14 and Aug. 28 issues of Motor Age)

NEXT to the lathe the upright drilling machine or drill press, as it is commonly called, is probably the most useful piece of equipment in the automotive shop which does all-around work. In fact, if but a certain amount of money is available for buying equipment it probably is a better investment to purchase a good drill press and hold off on the lathe for a time.

The drill press must not be looked upon as a machine to be used to advantage for drilling holes only. It is a multiple purpose tool and as a shopman recently said, it is almost impossible to state fully all the operations for which the drilling machine can be used.

Drilling a Frequent Operation

In every shop that does a variety of work the drilling of holes is a frequently performed operation, made so largely because of the fact that bolts and studs are used so extensively for holding parts together. Drilling machines or drill presses are made in a great variety of types and sizes to handle all kinds of work, but as the automotive shop is not interested in production work where a great many pieces of the same size and shape are drilled any reference to multiple spindle drilling machines and radial drilling machines is purposely omitted.

Much that has been said in previous issues concerning the lathe for the automotive shop applies equally well in the discussion of the drill press. Particularly is this true when it comes to the question of a motor-driven drill press over one driven from line shafting.

The motor-driven equipment always costs more, but it has certain advantages. It is not necessary to put the entire line shaft and belts of other machines into operation when only one machine is



Two types of reamers which can be used to advantage in the drill press for accurately finishing holes. The advantage of the shell reamer is that reamers of different sizes can be held in one arbor. The other reamer shown has a taper shank to fit the chuck of the drill press

called upon for work. Also, motor-driven equipment does away with belts and naturally makes a better looking shop and allows more light because of less interference of belts and countershafts. Besides, it is quite a job to properly maintain line shafting; loose pulleys have to be kept oiled and if the ceiling is not of the best construction the anchoring for the line shafting is likely to get out of line and this raises havoc with the tension of belts.

Taken all in all motor-driven equipment, by which we mean each machine has its own electric motor for driving it, is preferable, providing the shop can stand the extra initial cost. If a new shop is to be equipped or if the line

shaft already is installed it must be left to the discretion of those in charge as to what type of equipment is best.

Having settled on the type of drive, the next thing is know what size machine to buy. Along this line we have made some investigation which seems to indicate that a 20-inch, back geared press with a power feed is the best buy. The 20-inch size means that the press will drill a hole in the center of a 20-inch circle.

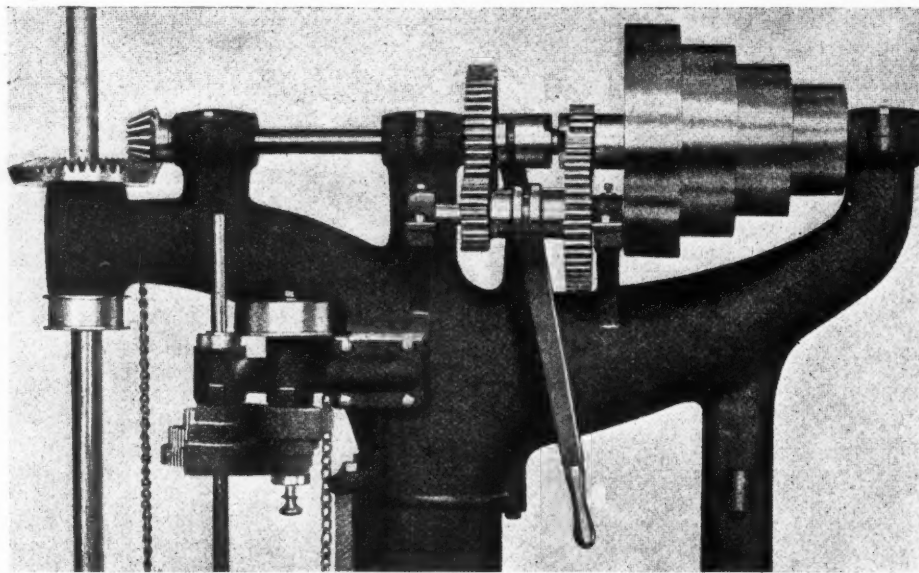
The beauty of having a back geared press is that it allows a great range of speed to the spindle and, therefore, the press can be used on boring and reaming operations where much slower speeds are required than for drilling. The power feed feature naturally can be used to advantage on the boring operations, as the cutter will be fed through the hole the same as is done in a lathe, when the latter is used for boring operations. Right here it might be stated that the drill press is in reality an offspring of the lathe because many operations which can be done in the lathe can be done equally well in the drill press. The drill press has the advantage when it comes to drilling because of the vertical spindle which makes it possible to place heavy work on the table of the press rather than support it on the lathe.

Get a Big Enough Press

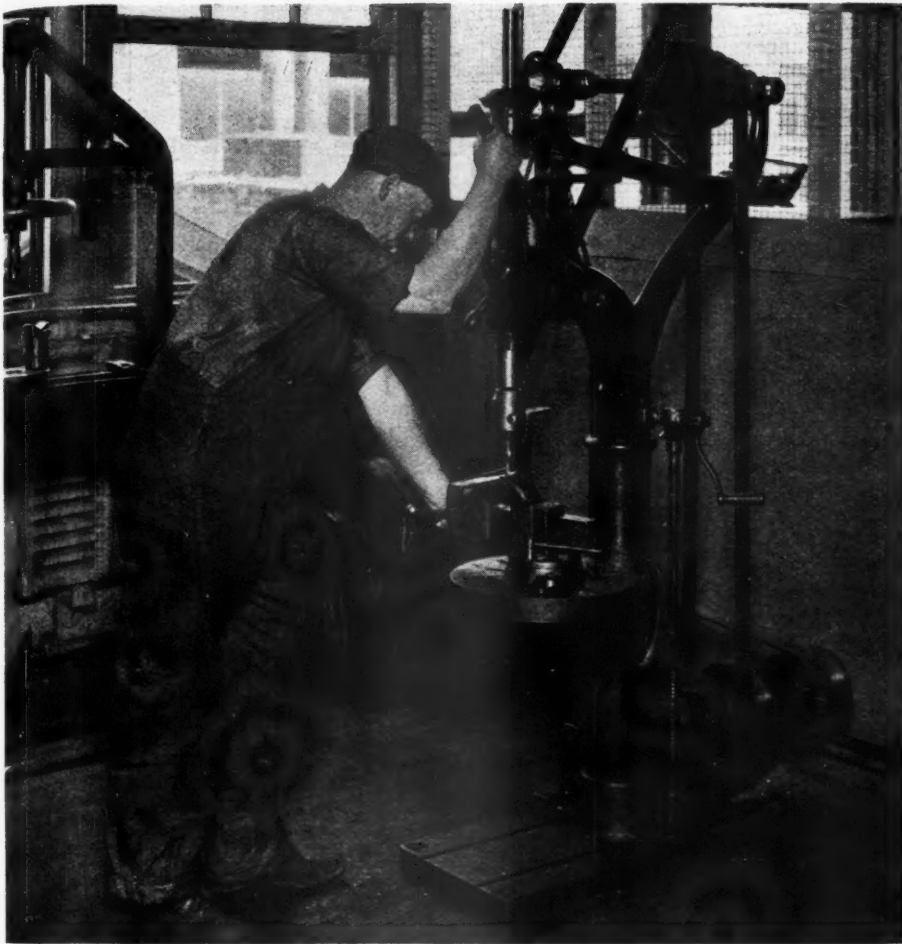
In buying a drill press it pays to get a large enough one because any holes of small diameter can be easily handled in an electric drill, especially when the latter is fitted with a bench stand which makes what is commonly called in machine shops a "sensitive drill." Of course, if money is no object and the shop does quite a volume of work it will pay to supplement the large drill press with a sensitive press. The latter are comparatively cheap, inasmuch as they have not the back geared feature and usually are fitted with hand feed on the spindle.

With a 20-inch drill press it is possible to drill a hole as large as 1 1/4 in. in diameter, but it is possible to do boring jobs of a much larger diameter, because the boring tool takes a much lighter cut. To give an idea of the usefulness of the drill press, here is what happened in one shop.

The shop was called upon to do some work on connecting rods of an engine which was an old timer. The rods were quite large and it was necessary to bore out the big ends. Ordinarily this would have been quite a problem and although the job could have been handled on the lathe, the set-up would have taken con-



A close-up of the back gearing and feed change gears of a typical drill press



By all means provide some way to hold the work that is being drilled. The market affords attachments which can be clamped to the drill press table and which insure accurate work. Often holes have to be drilled at right angles to each other and for this a holding device with parallel surfaces is a most useful attachment

siderable time. But, a boring bar or boring tool holder was made to fit the taper in the chuck of the drill press and a cutter fitted in a slot in the bar in the conventional manner. Each rod was clamped in turn to the table of the press, shims being used under the piston pin end of the rods to bring the rod at perfect right angles to the spindle of the press. Then, by using the proper gears of the press the speed of the spindle was cut down and a very fine job of boring resulted.

The automotive shop and especially the one located in rural sections, often is called upon to help out the farmer in his repairs on motor cars, trucks, tractors and farm machinery in general. Frequently such jobs take the form of rebushing large pulleys and flywheels and often these are too large to be handled in the lathe unless the latter is of the gap bed type. Here again the 20-in. drill press is a life saver, because with some ingenuity on the part of the mechanics, these and almost any kind of other boring job can be handled.

Holding the Work Properly

It is well to invest money in a vise for the drill press, which makes it possible to properly hold the work while it is being drilled or otherwise worked upon. Often two or more pieces have to be drilled exactly alike or pieces have to be drilled with holes at right angles to each other and here the vises which are ac-

curately machined so the sides are parallel come in handy. The drill press table is machined flat and placed at right angles to the spindle and consequently if a vise with accurately machined surfaces is used to hold the work the latter is bound to be accurate within a few thousandths of an inch.

Milling Attachment Useful

It is possible to broaden the scope of the drill press with a milling attachment, which is clamped to the table of the press. Inasmuch as such an attachment allows of a feed in two directions an almost endless variety of work can be done by using the proper cutters. For instance, the making of T-slots can be handled in this way.

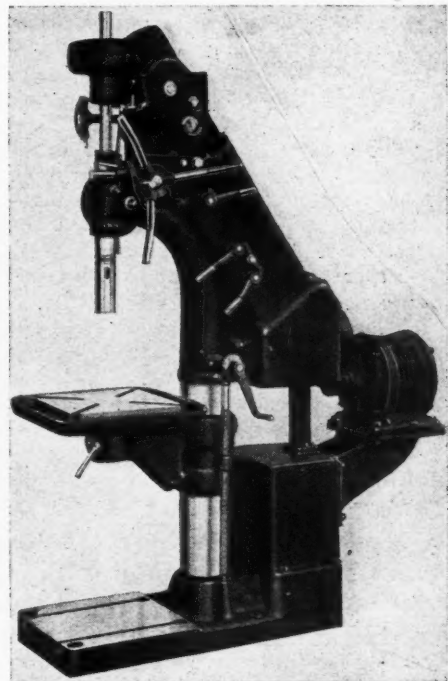
Holes that are drilled may not always be round or straight and the diameters may vary, especially when the drills are sharpened by hand. Therefore, to insure a dead accurate job the drilled holes are finished by reaming. To that end the drill press can be used for reaming holes, it being necessary to substitute the proper reamer in the spindle in the chuck of the press and proceeding as with drilling with the exception that a much slower speed is required. For reaming in a drill press it is best usually to use a "rose" reamer, as the latter cuts from the bevelled edges at the end and the fluted cylindrical body back of the cutting edges fit very closely into the hole and therefore guides the cutting

edges. If much reaming is done it will pay to buy shell type of rose reamers, because reamers of different sizes can be held on the same arbor.

A further but not quite so an important use of the drill press is that of an arbor press. It is possible to use the vertical travel of the spindle for forcing bushings in and out and perform other jobs of a similar nature. This is only true of light work, however, as it is not intended that the spindle of the press be used with great force behind it, as is the case with an arbor press.

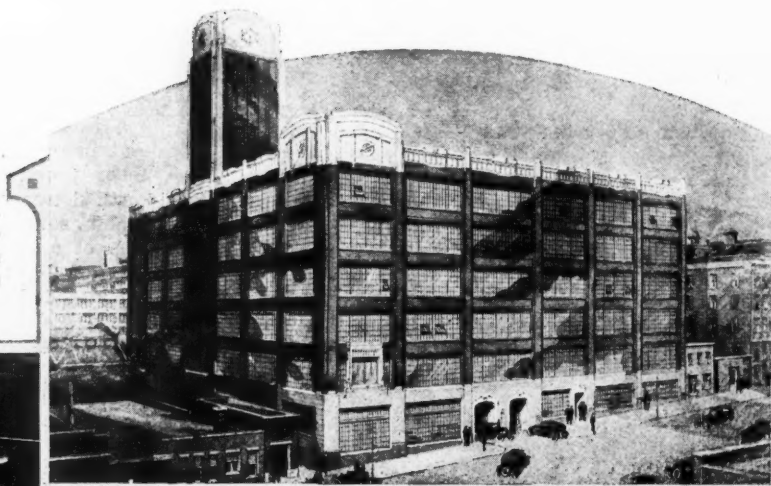
NEW STARRETT BOOK IS MANUAL FOR THE REPAIRMAN

The Starrett Book for Motor Machinists and Auto Repairmen is now off press. It forms volume III of the Starrett books, the two other volumes being The Starrett Book for Machinists' Apprentices and the Starrett Data Book for Machinists. The present volume consists of over 200 pages, 4 1/2 x 7 in., attractively bound in artificial leather and into it has been gathered a wealth of information and data which an automobile repairman would have occasion to need. Constructions, reasons and uses are given of measuring tools, micrometers, files, hack saws, reamers, drills and a variety of other tools used in automobile repairing. A great deal of tabular material is in the book, including drill speeds, screw threads, tap drills, thread standards, keyways, grinding wheels, gages, etc. The book is copiously illustrated with line drawings, diagrams and sections. Like the other Starrett books, the present volume is sold at 75 cents a copy. It is published by L. S. Starrett Co., Athol, Mass.



One of the latest types of upright drilling machines. It is a 20-in. press and has eight changes of speeds, power feed for the spindle and other features which make it well suited to the needs of the automotive shop handling a great variety of work

Exterior view of new Studebaker service station in New York City and a panorama of one of the shop floors showing immense size



The usual factory-like appearance has been done away with in the artistic treatment of terra cotta and face brick



Studebaker's Largest Service Station

New Building Recently Opened in New York Has Facilities for 300 Repair Jobs a Day

By J. HOWARD PILE

A SERVICE station capable of handling three hundred repair jobs a day has recently been completed in New York for the Studebaker Corporation of America. This is probably the largest building devoted to service in the United States. Located accessibly to the New York subway at 125th street, it extends clear through from 131st to 132nd street about midway between Broadway and Riverside Drive. The building is 200x175 ft., six stories high and surmounted by an imposing tower which reaches a height of 154 ft. above the street level. The building proper is 94 ft. high and the total floor area is 210,000 sq. ft. without deducting for ramps, elevators, and the like.

The exterior appearance of the building is most pleasing. While planned for a maximum of daylight from large windows all around, the usual factory-like appearance has been done away with in the artistic treatment of terra cotta and face brick. Ornamentation in harmony with the building adds greatly to the attractiveness and the tower is surmounted by an electric sign which shows far above the famous "Drive" away over into New Jersey.

To Care for All Manhattan Service

The building was completed the middle of July and service departments formerly quartered in three different buildings were immediately moved into the new building which is to take care of all Studebaker service on the Island of Manhattan. Customers in the Bronx will be served from another service building slightly more convenient in location to that district.

At the present time the station is handling approximately two hundred repair jobs a day but the equipment and personnel is not quite completed.

Due to a natural grade it is possible to have a direct en-

trance to the first floor from 131st Street and a direct entrance to the second floor from 132nd Street. In the former case there is a short ramp down from the street to the floor and in the latter case there is a short ramp from the street up to the second floor.

Made to Appeal to New Car Buyer

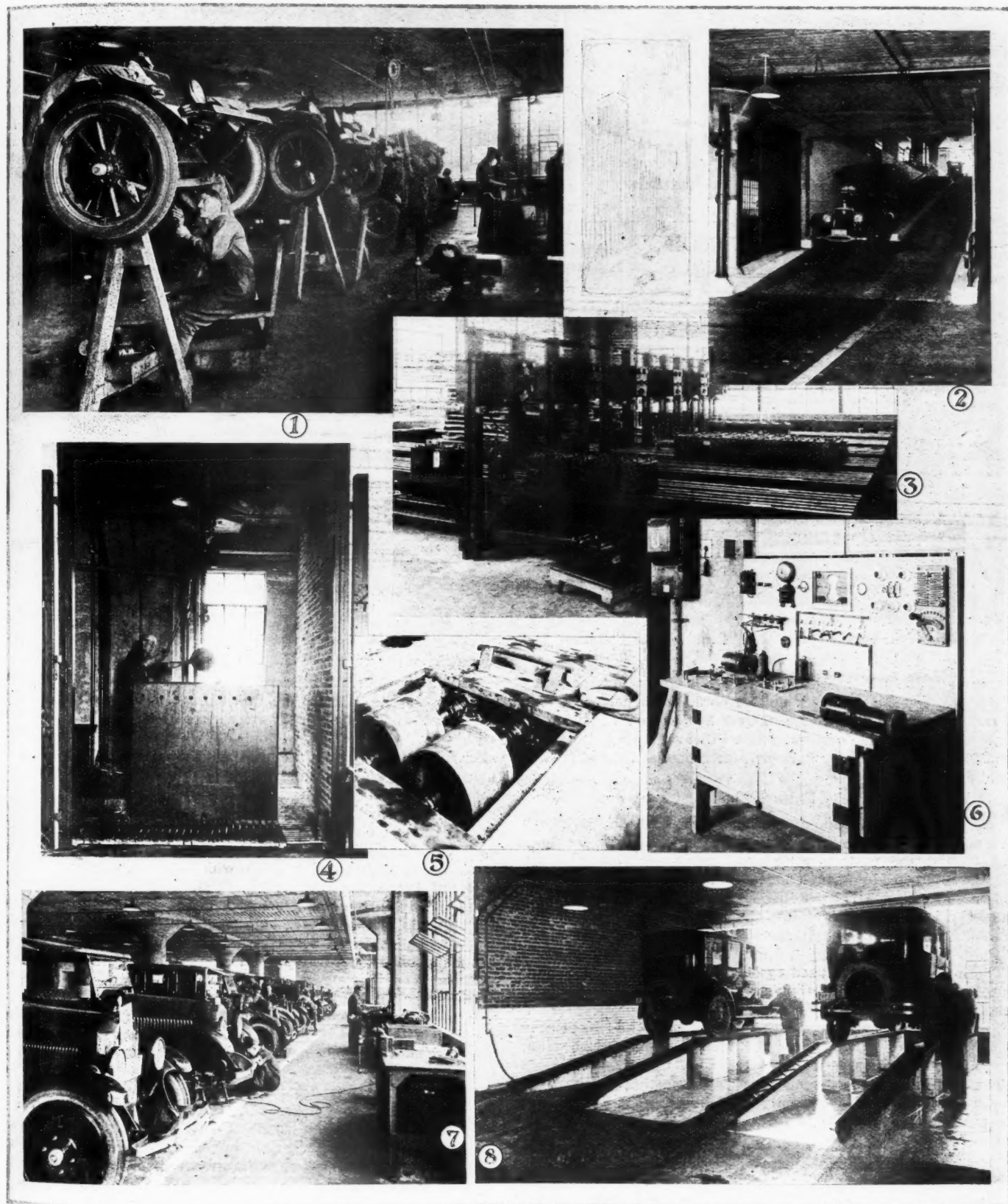
In addition to taking care of service, the new building is being utilized for the delivery of new cars to customers. Not only are there ample room and adequate facilities for the delivery, but the customer is brought at once into the fine modern building which has been fitted out for servicing the cars. Having once been in the building and knowing how to get to it, it is thought that he will be more likely to come back when he needs any repair work done.

New car deliveries are made from the 132nd Street side where a commodious waiting room with rest room facilities, telephone, etc., are at the service of the customer. A gasoline pump, oil supply, water and air are convenient so that the car can be sent out with the customer with everything in proper shape. Frequent automobile service between the service station and the salesrooms makes access easy.

One of the features of the building is the very extensive ramp system. Double ramps connect all floors excepting the two topmost ones which are reached by single ramps. One elevator provides service for cars unable to get up the ramps through being crippled in some way, but the ramps are to be used in all cases in preference to the elevator.

Almost unlimited provision has been made for the use of compressed air and electricity. Numerous air outlets are provided at all points in the building, as are electric outlets. The

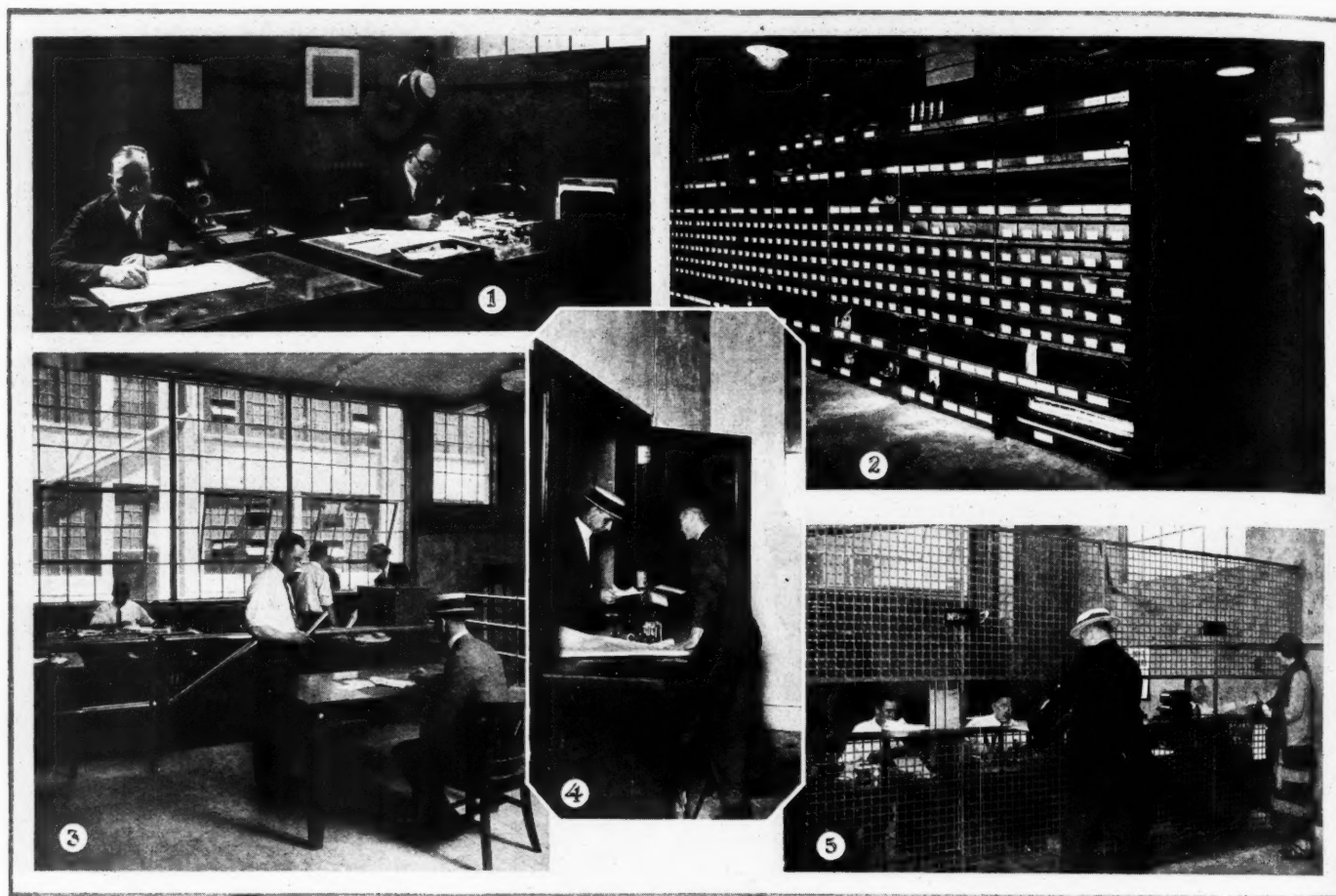
Some Shop Close-Ups in N. Y. Studebaker Service Station



1—Use of the overhead rail and horses in front end work. 2—One of the double ramps. 3—The six double charging benches having a total capacity of over 200 batteries at once. 4—The alkali bath with overhead rail. 5—The running-in stand. 6—Electrical test bench in the electrical department. 7—Looking down one of the repair bays. 8—The half-and-half department featured by white glazed brick wainscoat and white mosaic floor

work is well departmentized. So-called short orders or jobs which require less than an hour to get out are handled by a department on the second floor reached by a separate entrance.

Electrical work is handled in one department which is divided off by a wire screen partition. In this room facilities are provided for testing all of the various electrical equipment on



1—The service manager's office. 2—All the bins and drawers for stock are of steel. 3—New car delivery office. 4—Parts salesman trying to convince a hard customer. 5—The information desk and order department

the car and in addition there is a very large battery charging equipment consisting of six double charging benches capable of taking care of a maximum of over 200 batteries at once on charge. A truck on casters that will carry two batteries is used to take the batteries back and forth between the electrical room and the cars.

Chain Hoists and Tracks Feature Shop

Extensive use is made of overhead tracks with chain hoists. On floors where repairs are made these tracks allow the moving of parts and units to practically every point on the floor. A large alkali cleaning tank located on one side of the general repair floor has a track leading right over it so that parts or units can be dropped right into the tank by means of a hoist. Tracks also lead to the machine shop, engine stands and along all bays where cars are parked for repairing.

These hoists are also used to elevate the front ends of cars onto horses for front end repairs. These horses are of such a height that the mechanic in a comfortable seated position can get at the oil pan, bearings, steering gear parts and front axle parts. Bins are provided for the piston assemblies, bearing caps and other parts as they are taken off.

The parts stock room occupies a large portion of one floor and is so laid out that it is easily available to the shop and also the customers who come in to purchase parts. Retail stocks only are kept in this building, all wholesale orders to dealers being handled from an entirely separate department in another building. The office and cashier for the parts department are in a separate room connecting with the stock room. Steel shelving, bins and boxes are used to hold the stock.

The running-in stand which is part of the built-in equipment of the building is of considerable interest. It consists of two shafts mounted on three bearings each, each shaft having two large cast iron rollers on it. The car is rolled onto the rollers with the front end blocked and the car started up through the gears in the usual way. The engine can be operated on the block for any length of time desired, the exhaust being conducted outside the building by means of a hose.

Ordinarily the dirtiest part of any service station is the oiling and greasing department, but in the Studebaker service station, these half-and-half stands, as they are called, are constructed with white tiling on the floor and wainscoat. Two elevated stands bring the cars to a convenient height so that the greaser can lubricate all parts and remove squeaks with a mixture of half oil and half kerosene squirted in all points likely to cause squeaking by rubbing. A constant stream of water over the floor carries off all oil and grease and keeps the floor clean and white at all times. The men who work on these racks wear shoes with wooden soles which not only prevents wet feet but keeps the men from slipping. Cars are prevented from sliding on the grade irons by means of diagonal cleats.

The parts of the service station devoted to office or clerical work and also those departments made use of by customers are handsomely decorated with marble basework and tinted walls and ceilings. A pleasing shade of brown superimposed on a lighter shade gives a mottled effect.

With the exception of the short order department, all cars for repair or for any other purpose enter on the first floor where a card is made out noting the time of entry and such other details as are necessary. The routine is then for the car to drive into the first floor where a tester is assigned to advise as to the work necessary. Quite convenient to this spot is the information desk, cashier's desk and other departments to which the customer will need to go. The office of the service manager and the assistant manager are also located close by.

Service Manager Not Wrapped in Details

The work has been arranged as far as possible to leave the service manager clear of detail so that he can plan the entire work of the building, attend to any things that for the moment do not seem to be working smoothly. He can in this way keep abreast of the very latest practice in shop work and apply it as he sees fit.

The entire personnel of the station, including both shop and office workers is about 250 persons at the present time, but when working to full capacity, this number may be increased.

French Grand Prix Proves Value of Super Charger

One-Hundred and Twenty-two Cubic Inch Engine Outperforms 275 Cubic Inch Engine Used by Winner in 1914. Semi-Balloon Tires Used on Sunbeams

IN winning the European Grand Prix 503-mile race on a straight eight 122-cu. in. Alfa-Romeo, Giuseppe Campari, scored a notable victory for Italy and at the same time broke the record set up in 1914 when the French Grand Prix race was held on a portion of the same roads. Ten years ago the winning Mercedes of 275 cu. in. piston displacement averaged 65.5 m.p.h. This year, with the course shortened and rendered infinitely more difficult, the average was 71 m.p.h. Some indication of the nature of the 14-mile course can be gained from the fact that at least twenty gear changes per lap were required and less than five miles of the fourteen were covered on direct drive. On one stretch of switch-back road the car attained a speed of at least 130 m.p.h., and yet the record lap, established by Segrave on a six-cylinder Sunbeam was only 76 m.p.h.

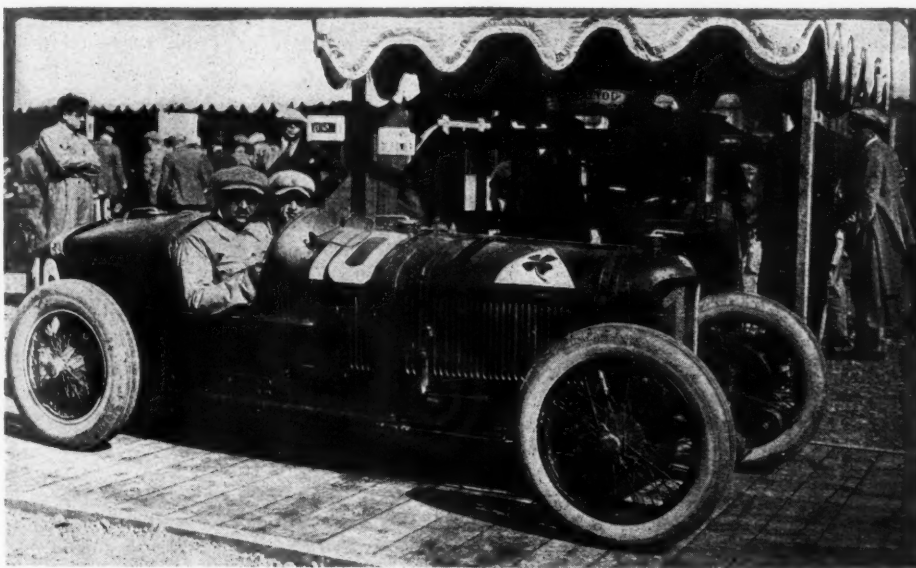
The Alfa-Romeos went through without lifting their hoods, and no mechanical trouble developed until Ascari stopped with his engine completely seized up. Fiat, for the first time in an international contest, lost all four cars, this being partially due to incomplete preparation.

Nazzaro had plug troubles and also, it was reported, fractures around the valve seats in the steel cylinders which allowed water to pass into the cylinders.

Of the three Sunbeam cars the troubles lay with a broken universal joint on Guinness's car, defective valves and magnetos on the two others, and minor trouble with the brake gear.

The only Miller in the race was an entirely private entry for which Count Zborowski was responsible. It ran for 112 miles and was finally put out by broken spring clips. Zborowski had added a fourth gear in order to make the car more suitable for this hilly course, and he had also equipped it with a second scavenger pump, driven by a small air propeller in front of the radiator. In the original design the feed and the scavenger pumps were the same size.

Owing to lack of time, superchargers were not fitted to the Delage cars and as the power was known to be much lower than that of the others, and the cars did not have the same maximum speed, they were hardly looked upon to furnish the winners. No mechanical trouble of any kind developed, and had the race been a little longer Delage might have got into first place. He was the only one to finish with a complete team.



Campari seated in the Alfa Romeo with which he won the 1924 French Grand Prix

Bugatti, who also ran without a supercharger, realized after the first lap that the Dunlop straight side tires were quite unsuitable for these road conditions. The tires, which, it is declared, had been built to Bugatti's own specifications, had a perfectly flat heavy rubber tread which completely frittered away when high speed was indulged in. The drivers realized that it was no use pushing, and most of them kept engine revolutions down to 4,500, whereas they could have run at 5,500, but even at this reduced speed tire life was short. The flat spoke cast aluminum alloy wheels, which Bugatti declares weighs 4 lbs. less than a wire racing wheel, gave every satisfaction.

This race proved the value of the supercharger, which device was used by Alfa-Romeo, Fiat and Sunbeam. Since last year the Fiat engineers have added an air cooler to their appliance, this being carried between the front frame horns and assures the air reaching the carburetor at a very much lower temperature than on last year's models.

Practically the same type of supercharging device was used on the Alfa-Romeos as on last year's Fiats, with the difference that a Memini carburetor was employed. Sunbeam was the only one having the carburetor before the blower.

Only one Schmid cuff valve engine started in the race. Goux, the driver, was held back on the first lap with a seized brake and went out after rather more than half distance with a leaky radiator.

The cuff valve mechanism gave no trouble.

Every car in the race had a Robert Bosch magneto, with the exception of the Miller, which was Delco equipped, and no ignition trouble of any kind developed. Plugs were divided between Champion, used on the winning Alfa-Romeos and the Delages, K. L. G., and Bosch. The engines without a supercharger did not suffer in any way from plugs.

For the first time use was made of semi-balloon tires with a lower pressure than is customary in races. The Sunbeams had a new type of Rapson semi-balloon clincher bead cord tire inflated to 40 lbs. pressure. The Pirellis on the Alfa-Romeos and Fiats were of 5-in. section on the driving wheels and had a pressure not exceeding 40 lbs. Trials had been made with 6-in. tires, but these were not used in the race. Delage used Michelin high pressure tires. In the case of Rapson, Pirelli and Michelin, no tires were changed except as a precaution.

No race has ever been run in which brakes have received such punishment. Every car had a four-wheel equipment with mechanical operation, no brakes being fitted on the transmission. Delage and Sunbeam had the Perrot system, with a geared down servo drum on the back of the gearbox. Fiat used the same type of hydraulic servo mechanism as on one of the standard models.

Putting Speed Into Car Washing

At the Same Time System Now in Operation at 40 Plants Removes All Dirt From Chassis as Well as Body—Service in Demand

By TOM WILDER

CAR washing has always been one of the "chores" of our industry—a necessary expense that everybody must pay but that nobody enjoys. It is one of the expense items that falls heaviest on new cars and consequently hits the dealer hard. Drive-away cars from the factory must be washed to a completeness never necessary afterwards and demonstrators must be kept in an almost perfect degree of cleanliness.

There has long been an opening for a system of washing that would be at once thorough and fast and for several years there has been a growing interest in the air-water-pressure-spray system as the nearest to an answer to the problem.

Various schemes have been devised to use this principal to the best advantage. At first it was used on an ordinary wash rack or platform, then after the effect of the air and water mixture was better understood cars were raised up at one end with a hoist so that the running gear could be more easily got at and cleaned. Later other methods were employed to elevate the car and save the time and effort of hoisting it. Some were elevated runways with an incline at either end while others were in the nature of pits with a runway across.

There seemed to be so much interest in the scheme that MOTOR AGE designed and published a plan and offered blueprints to all those who desired them and as a result there are many plants being built and some already in operation.

The equipment for these racks has always been home-made and the proportions of piping, tanks and pumps have been guessed at with the result that most of them are somewhat inefficient or wasteful in one way or another.

But now any man who wants a wash rack of this type, without the trouble of designing and building it himself and without the attendant worrying as to whether it will work when it is built, can send in his order and have one delivered to his building complete and ready to run in a short time. And what is more he will be instructed in its operation before it is turned over.

J. P. Nicholson, for many years in the automotive line in Chicago, has for the last two years been operating several plants principally to study the thing out for results. Changing here, trying something else there, experimenting continually, with pressures, different equipment, and different progressions.

Incidentally he has discovered new and patentable principles which he claims make his plant better than any other and which gives it a better market value as well.

The plant consists of a water heater and tank, a motor, compressor and tank, soap mixing apparatus, two large water vaporizer tanks, smaller kerosene vaporizer tank and soap tank, together with all the various valves, nozzles, hose, piping, gages, etc., necessary for proper operation.

The rack itself is a 16 foot concrete pit across which extends a concrete track topped with 10 inch channels and in the center of which is a properly constructed catch basin. An 18 foot wall, 3 feet high along the edge of the pit protects the rest of the room, as when in operation the nozzles make quite a fuss.

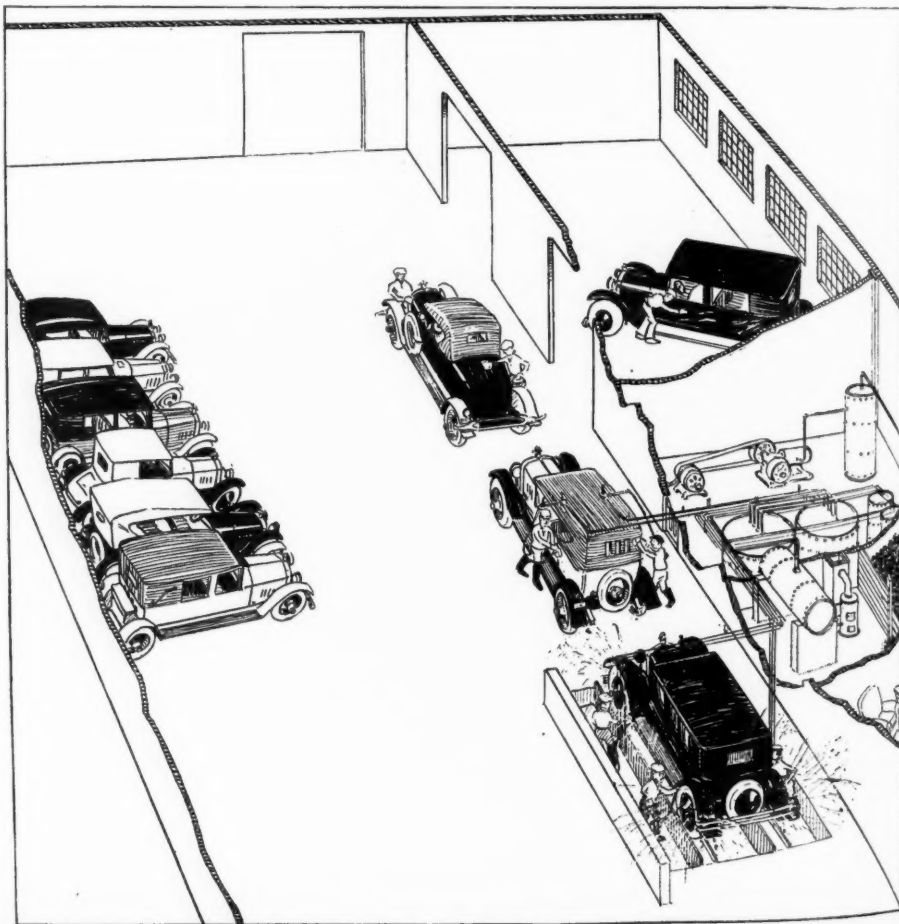
Mr. Nicholson's system provides a spray of unusual softness due to the intimate mixture of air and water furnished by his equalized pressure system and his special mixing valve, but even though it is so soft it removes the dirt and grease better than if it were harsh.

The Klean-Rite Auto Laundry System, as it is called, does not use a high platform to wash the top, but attacks the chassis at once with the air and water

spray nozzles. After this process is finished the car is pushed from the pit to the floor where with an air nozzle, the dirt and dust is all blown out of the inside after which the body is washed by hand. A movable step at each side allows the man to wipe off the top with an oily mop and wipe it clean with a cloth after the car is pushed to the next position where it is chammoised dry. The last process consists of using a kerosene spray on all the running gear which is to penetrate in to the cracks and rusty places preventing further rust. Polishing with body polish and vacuum cleaning are extras.

A full crew consists of four men on the spray nozzles, two on bodies and two on chamois work, but a half crew of men on the spray nozzles, one on bodies and one on chamois wiping, works well, or the crew may be reduced further with the spray men doing the body work and one extra for finishing.

The Klean-Rite Auto Laundry Company already has in operation or under construction about 40 plants.



Birdseye view of a washing plant equipped with the Klean-Rite auto Laundry system

25 Years Ago In the Automobile Industry As Recorded In MOTOR AGE

(From MOTOR AGE of September 12, 1899.)

In visualizing the automobile of the future, MOTOR AGE in this issue had the following to say with respect to the desirability of diversification of patterns:

"By means of suitable combinations in regard to the weight of vehicles, the power of motors, the number of cylinders, the character of gearing, the perfection of lubrication, the metal spring and tires and by skill of the driver, most of the inconveniences arising from the lack of flexibility in explosion of motor power may even now be reduced to a minimum, but it is apparent that for the best results the public must look to inventions in construction of gasoline motors and power transmission which have not yet seen the full light of day.

"Until they shall have been commercially developed it remains highly necessary for the public to see to it that the vehicles which they purchase are specially constructed for the work they are intended for by the proper combination of the various features above referred to."

Pneumatic tires for automobiles were early advocated. An advertisement in this issue of MOTOR AGE uses as a selling argument the fact that they save repairs, time and temper, "provided they stand the strain," and then goes on to say that the product of the advertiser will wear as long and ride easier than any continuous solid rubber tire. The manufacturer announced itself in a position to equip vehicles from 30 lbs. to 3 tons.

Another tire manufacturer greets the public with this:

"STREETS OF GOLD

are the dream of the righteous, but our cobblestone and granite pavements may be made to seem as such and the fancy of the dreamer made the reality of the present by fitting all motor cabs and carriages with resilient, durable, practically and scientifically correct pneumatic tires. Springs tend to cure vibration and in the curing give birth to tiresome bouncing and jolting. Pneumatic tires prevent vibration and save the need of cure. The

WHEN the automobile first made its advent it immediately found favor with the wealthy. Mrs. O. H. P. Belmont, assisted by Mrs. Herman Oelrichs and Mrs. Stuyvesant Fish, staged an automobile parade at Newport. Nineteen automobiles, all beautifully decorated with ribbons and flowers after the fashion of the Parisian automobile parades, assembled at Belcourt. Among the drivers and guests were Mrs. W. K. Vanderbilt, Jr., Col. and Mrs. John Jacob Astor, Mrs. J. R. Drexel, Mrs. Clarence Mackey and Mr. and Mrs. Joseph Widener.

APETROLEUM gas motor has been perfected by George A. Whitcomb of Framingham, Mass., in which a rotary piston that also has the motion of the ordinary reciprocating piston, takes the place of the poppet or needle valves usually employed for securing admission of explosive mixture and exhaust and exhaust of the products of combustion.

In this respect the Whitcomb seems to have points in common with the motor designed by H. C. Baker of Hartford, Conn., but the rotary employed by Mr. Baker is purely rotary and has no reciprocating motion.

The Whitcomb motor, it is stated, may be operated with one or more cylinders, in the latter case allowing a considerable horsepower, without recourse of water jacket for regulation of the temperature.

learning of this lesson in the bicycle industry was a long and expensive task. Motor vehicle makers can profit by the experience and start right. Pneumatic tires unqualified, however, may mean but little. Get the best."

Stanley Wagon in France

A cablegram to the New York Herald announces that the American Automobile & Motor Co., Ltd., has just concluded a very important contract with the Locomobile Co. of America, of which A. L. Barber is president. The company has acquired all the rights of the Stanley automobile.

Vicomte de Jotemps is the general manager, with offices at 47 Boulevard Hausmann. The French company, it is stated, will absorb about one-half of the production of Stanley steam wagons of which the Locomobile company is capable.

Automobile Ascends Mount Washington

The first automobile to make the ascent of Mount Washington, 6,300 ft. above sea level, arrived at the summit shortly before noon on August 31, writes a correspondent from Fabyan House, N. H., to the New York Sun.

"In the carriage were Mr. and Mrs. F. O. Stanley of Newton, Mass. * * * The distance of ten miles was covered in two hours and ten minutes. This time included delays in replenishing the water tank. The time is less than half that required by the teams that make the trip with carriages."

The Stanley carriage was used for the climb.

Attraction for County Fairs

Mr. Snow of Wyoming, Ill., has purchased one of the new Duryea four-wheeled motor wagons made by the Peoria Rubber Mfg. Co., and is making the circuit of county fairs in Central Illinois

to exhibit the wagon to the farmers. At Galesburg it is Mr. Snow's intention to have a race with Dr. Morris of that town who owns a motor vehicle of another make.

Plans of Syracuse Firm

C. F. Saul and William Van Wagoner of Syracuse, N. Y., propose to build and market motor vehicles in the near future. They will make both electric and gasoline motor wagons. Mr. Saul is president of the Barnes Cycle Co., now absorbed in the American Bicycle Co., and is also a carriage manufacturer and dealer. Mr. Van Wagoner has been identified with the bicycle industry since its beginning, and has for several years been responsible for many of the successful features of shop practice in the Barnes concern. The mechanical construction of the vehicles to be manufactured is the result of his efforts.

News Notes

The Oakman Motor & Vehicle Co., Greenfield, Mass., lately organized with a capital of \$5,000,000, contemplates the erection of its main factory near Philadelphia. The Greenfield plant will be retained.

The Howard H. Brown Automobile Co. has obtained title to the property of the Elgin Sewing Machine and Bicycle Co. and is arranging for additional machinery.

E. N. Winship and others are organizing an automobile manufacturing company at Napa, Calif., to produce vehicles under Charles E. Duryea patents.

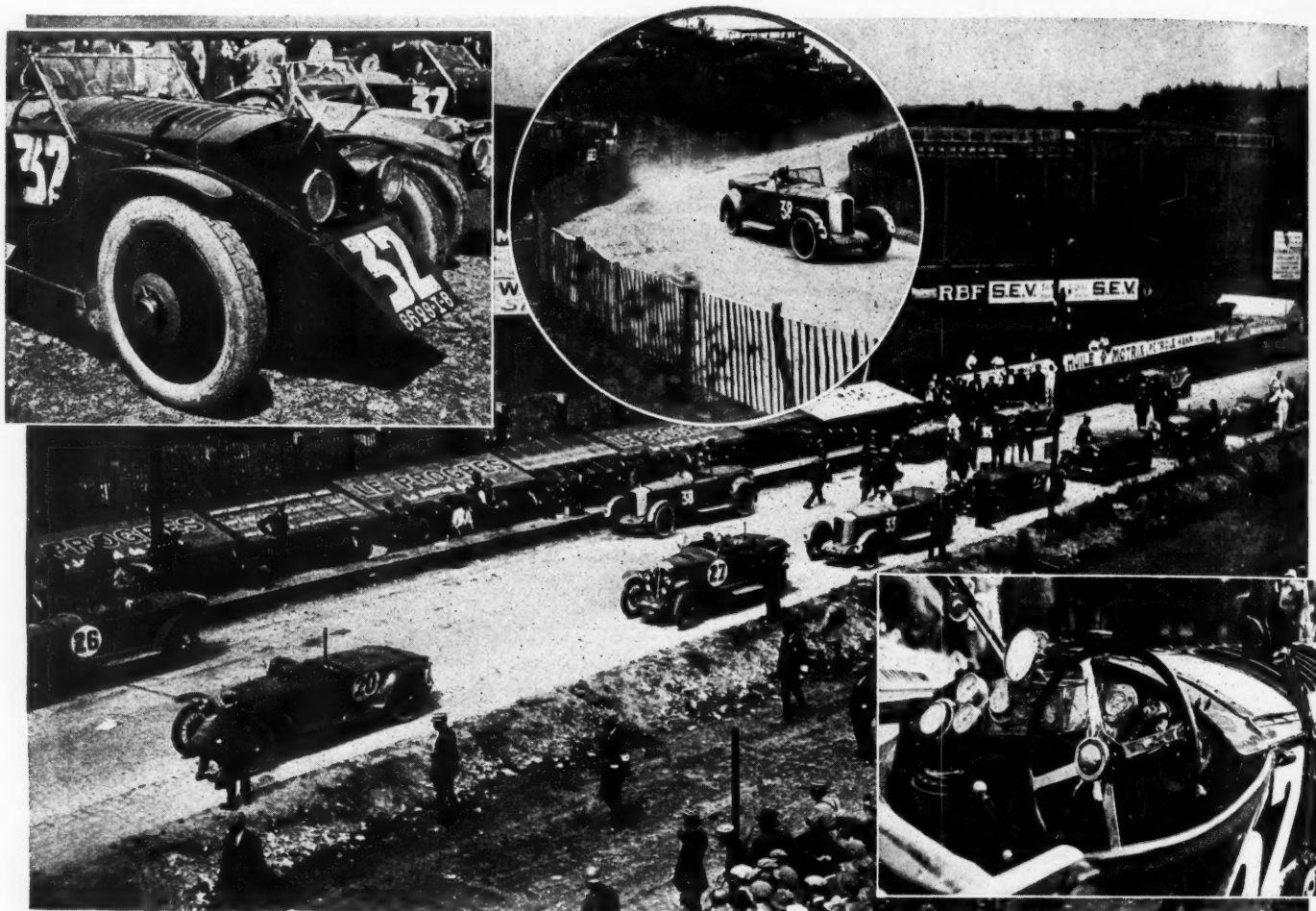
The League of American Wheelmen harbors a plan for inducing all owners of automobiles to join under its banner for the good roads movement.

John Loon & Son Co. of LaPorte, Ind., is getting ready to enter into motor vehicle manufacture.

In Berlin an electric omnibus service has been instituted, but it is restricted to asphalted streets.

DELIVERY has ever been an important point to be considered in the sale of automobiles, and that it was uppermost in the public mind in the early days of the industry is shown by the advertisement of the Graham Equipment Co. of Boston which proudly announced that it was in a position to deliver immediately ten steam carriages. A consignment of ten automotive vehicles would not go far these days when everybody wants one, but apparently it was considered quite an achievement at that time.

MOTOR AGE'S PICTURE PAGES

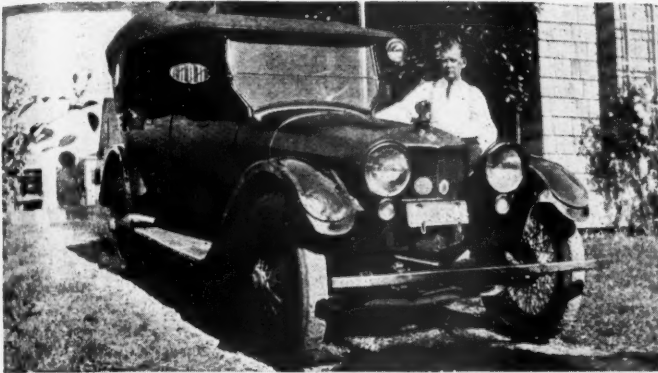


Some views of the French Touring Grand Prix, showing the lineup for the start of the great stock chassis race. Upper left, one of the frameless Voisins. Below, dash arrangement of the same car showing special gas tank beside driver and wire screen windshield. In circle, Peugeot making a turn

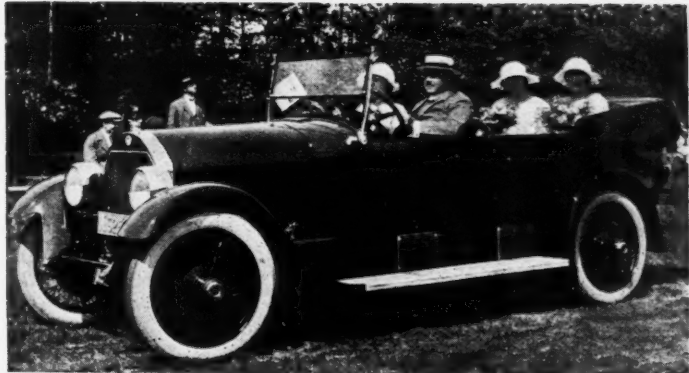


The Six Wheel Co. of Philadelphia, a motor bus manufacturer, saves \$1,000 in packing and shipping expense on each vehicle it exports by forwarding its product uncrated. A coach about 30 ft. long and 8 ft. high, occupying 1,775 cu. ft. of cargo space and weighing 11,000 lbs., was loaded into the hold of an American steamer with no cover of any kind over the vehicle. The loading was accomplished with ship's tackle and the coach deposited between decks without scratching the highly polished surface. The hatchway was less than 2. ft. longer than the coach

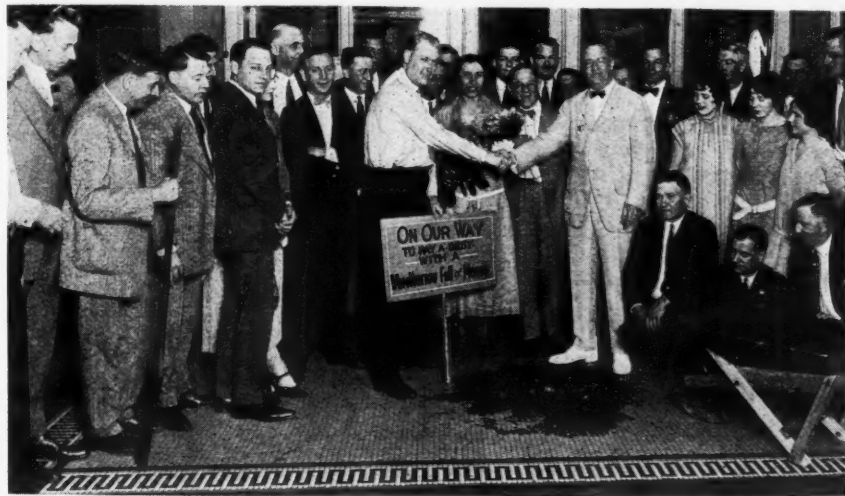
OF AUTOMOTIVE INTEREST



Enter in the list of old-timers the 1917 Premier of a Washington owner which has run 105,000 miles and is still going strong. "There may be more modern and niftier body designs," says he, "but when it comes to ability to deliver satisfactory service and provide adequate, comfortable transportation, I will place all my bets on my Premier"



Evidently the Stutz made quite an impression at the motor car show held at Arnham, Holland, recently, for it was awarded first, second and fourth prizes. First and second prizes went to the Speedway Six Tourster and the Speedway Four Bulldog



At the left is a government test car equipped with 90 pieces of testing apparatus. The stove-pipe device is to measure wind velocity and obtain wind protection. Among the things learned are the number of explosions in each cylinder, weight of air used by engine and amount of work done by the pistons in sucking in air and gas. The purpose is to secure improved motor efficiency and performance. Right, 25,000 pennies representing bet lost by Los Angeles Willys-Overland dealer in a sales contest. The victors were told to count their spoils



This is the way one Nash dealer announced the coming of the new 1925 line. Old Dobbin is getting so scarce that he serves well as a novelty here

The READERS' CLEARING HOUSE

Questions & Answers on Dealers' Problems

Buick Valve Timing

Q.—Advise the valve timing in degrees on a Buick model D-4. We also have a Buick model C-36 which has the same timing and the C-36 exhaust valve closes at about 10 degrees past top dead center, while the intake opens about 20 degrees past top dead center. This is just judging from the travel on the flywheel with reference to the only mark which is 7 degrees. We noticed that Buick motors as a rule are timed later than other motors and we would like to ask what, in your opinion, would be the effect of advancing the valve timing one tooth? We judge this would bring the exhaust closing point at about top dead center and the intake opening at about 10 degrees past top dead center. The model C-36 to which we refer heats up considerably and we were wondering if this change in valve timing would help this condition, and also if the motor would pull and throttle down as well at low speeds?

A.—Instead of model D-4 we assume you mean model D-44 or D-45. While we do not have the exact data on this model, we believe that it is about the same as on the C-36, for on four or five different models of Buick cars on which we have valve timing data the exhaust valve closes from 10 to 15 degrees past top dead center. This is not radically different from the timing on a great many cars although there are some which have the exhaust valve closed at approximately top dead center. We would not recommend your changing the timing, as the factory making the engine knows more about it than service men in the field. The 7-degree mark on the flywheel is intended to be the point at which the interrupter contacts of the ignition unit open when the lever is in the retard position. The effect of advancing the valve timing is that sometimes it gives better operation at high speeds, although there is no set rule. It, however, usually makes the engine idle poorly and is not to be generally recommended, although it is done sometimes on cars which are doctored up for high speeds. It would not have any benefit in reducing the heating. Overheating may be due to the radiator and cylinder jackets being coated with a deposit of lime or may be due to poor water circulation or to too lean a mixture due to improper carburetor setting or may be due to the spark not being advanced enough.

Difference in 6-Volt and 12-Volt Ignition Coils

Q.—What is the difference in coils designed for 12-volt service? We know that the resistance unit is made differently but is there any other difference? We recently installed a 12-volt Delco coil from a Dodge car on an Oldsmobile "8" and it worked fine. We did not change resistance or anything, so would like to know the difference.—S. W. Moebius, Frisco, Utah.

A.—The average six-volt ignition coil

The Readers' Clearing House

THIS department is conducted to assist dealers and maintenance station executives in the solution of their problems.

All questions are answered direct by letter, so the name and address should be given in full. This saves waiting for the answer to be published, which sometimes occurs several weeks late, depending upon the space available.

Readers' names will not be published with articles, if a request to this effect is received with the letter.

Inquiries not of general interest will be answered by personal letter only. Emergency questions will be replied to by letter or telegram.

Also state whether a permanent file of MOTOR AGE is kept, for many times inquiries of an identical nature have been made and these are answered by reference to previous issues.

Addresses of business firms will not be published in this department but will be supplied by letter.

Technical questions answered by B. M. Ikert, P. L. Dumas and A. H. Packer; Legal, by Wellington Gustin; Paint, by G. King Franklin Architectural, by Tom Wilder; Tires, by a Practical Tire Man; General Business questions, by MOTOR AGE organization in conference.

is designed to draw from 4 to 5 amperes at 6 volts when the interrupter points are closed. In changing from 6-volt to 12-volt design, it is customary to cut the current about in half when the voltage is doubled, so as to use the same amount of electrical energy. This would mean that a 12-volt ignition coil would draw 2 or 3 amperes with the interrupter points in contact. Of course, when the interrupter points are operating and making and breaking the circuit, the current will average about one-fourth of what it does when the points are closed. Any ignition coil is capable of operating at a lower voltage than the rated one. For example, a 6-volt ignition coil will probably give a fair spark at 4 volts, for it has to operate at a fairly low voltage in winter when the battery is low and the starter is taking a heavy current. You will find, however, that with the battery badly discharged, the spark is much weaker than it is when the battery is in good condition. For this reason we suspect that the 12-volt coil used on 6 volts gives a much weaker spark and we venture to predict that you might have trouble with this car in winter. You will also realize

that on a 6-volt system the battery voltage may come up to 7.5 or nearly 8 volts when the battery is well charged and the generator operating. Under these circumstances the 12-volt coil will give fairly good operation and you will probably notice no difference in the operation of the engine.

Must Have License to Operate Car

Q. A trades in his car for a new one and the salesman allowed him to take the license plate off his old car and use it on his new one. In the meantime the salesman sold the trade-in car to B mentioning nothing about the license plate. Now B found out that the license plate belonged on the old car and went after A for the plates. A gave the old plates to the salesman and obtained new plates for his new car. Now B wouldn't pay for the license and so he is running his car without a license plate for about two months. Can B be reported for running without plates and be forced to pay and take his license?

Wisconsin Subscriber.

A. It is specifically against the law for B to operate the automobile purchased from A under the license issued to A on the car so sold. Upon selling his car A is permitted to transfer his registry to any other car he may purchase, upon application to the Secretary of State upon blanks prepared for the purpose of transfer. License to operate a car is personal and is granted only by the state. Hence A cannot, nor could the salesman mentioned, by an act or deed, grant the right or license to B to operate an automobile upon the highways of the state.

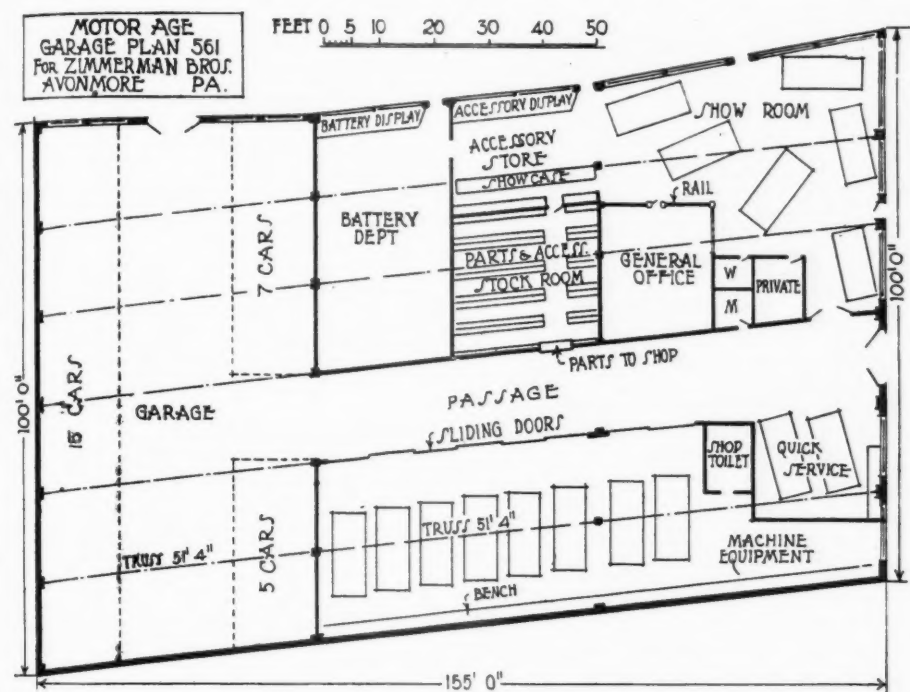
Where License Can Be Transferred

Now if B has already been granted a license for a car and has disposed of same he can have this license transferred to the car purchased from A.

It was unnecessary and an added expense for A to have obtained a new license to operate another car after he sold to B. He should have had his old license transferred. The cost is 50 cents.

Of course, B can be reported for running without a license, but he cannot be forced to pay A for the license issued to A on the car purchased from him. The statute states that in case of sales as outlined by you, it shall be unlawful for the seller to permit the use of and it shall be unlawful for the buyer to use the number plates upon the automobile under which the same had before being registered and operated.

Ample Frontage Makes a Desirable Location



Q.—Am enclosing a blue print of a lot on which we intended to build a garage with a repair shop for about eight cars, showroom, accessory and stockroom, battery department. Would like to have you publish a diagram of a suitable garage on this lot.—Zimmerman Bros., Avonmore, Pa.

A.—Since you have set no limit on the size of your building we have decided that you wish to cover the whole lot with it. The lot is a peculiar shape but well located apparently on a good corner and should make a very convenient building. These trusses as you will see are all of the same dimension and for this reason will be cheaper to construct than if they were of various lengths.

The showroom, of course, is on the corner where it can be seen from both directions and where it will display the cars to the best advantage. The accessory store is also a salesroom for parts and will be along side of the car showroom and on the main street. Adjoining this is the battery station. We did not know how big a station you desired and consequently have left it more or less undeveloped. You could use the space shown partly to service cars, leaving the rear wall open so that cars may enter or you could use the whole floor for battery service and rebuilding, doing the service end in the garage. The double row of sliding doors separating the passage between the garage and the side street, from the shop, is really a very good idea as it allows plenty of

ventilation in the summer and in the winter conserves heat, allowing the shop to be kept at a much higher temperature than is necessary in the garage. While we have not indicated the arrangement, ample skylight facilities could be supplied or this building would be very dark, it being so large that lights from side windows would not penetrate far.

Of course, there are dozens of arrangements for a building of this size but considering the easy access to all departments and the economical use of space, we think this plan is quite equal to any.

ELGIN CAMSHAFT WRINKLES

Q. What is the usual procedure in fitting new camshaft bushings on a Model K-1921 Elgin?

The procedure is similar to that in any engine for the whole camshaft together with bearings can be removed from the front end of the engine after the tappets have been lifted and the retaining set screw removed.

Q. When this engine was taken down a few months ago, it was noticed that the tops of the cams were worn. There was a slight ridge on each side of the top of each cam. What can we do to remedy this?—P. F. Nugent, Chicago, Ill.

One remedy is to have a regrinding concern grind the cam surface. Another remedy would be to use a new camshaft while the third method would be to have a very careful mechanic smooth up the surfaces with an oil stone.

Piston Rings That Break Repeatedly

Q. We have a 1922 Ford coupe that has been reground and has had new pistons fitted. The rings in No. 3 cylinder either break or stick every 200 miles. These pistons have two rings above the wrist pin and one below, there also being a bevel cut below the second ring with six holes drilled about 3/16 in. in diameter. They were originally fitted after regrinding with Pressure Proof rings but these did not allow sufficient lubrication in any of the pistons, so they were discarded and Gill rings with a lap joint installed. This corrected the trouble with the exception of the No. 3 cylinder so we discarded this ring and used a Gill Servus ring. We then experienced no more sticking but continued to have trouble due to breakage while the engine makes a heavy slapping sound. We have used a clearance of .008 in. at the end of the ring. The job of regrinding was done by a concern specializing in this work and the rods are supposed to have been aligned. The engine runs smoothly and does not knock until the rings in No. 3 cylinder go wrong. No. 3 cylinder is apparently no closer fit than the rest and shows no sign of being run out of alignment. I did not crowd this engine when tight and have used Vedol Fordol. In addition to the regular Ford oil pipe I used a Yale oiling system. No trouble was experienced before the regrinding job was done. The rods and main bearings were recently taken up by the Ford dealer here.—Missouri Subscriber.

1.—One suggestion that we have to offer is that you remove the cylinder head and carefully compare the height that pistons come out of the cylinder block. We suspect that No. 3 cylinder has a connecting rod that is slightly longer than the rest, so that the top piston ring comes too far out of the cylinder. In the Ford engine the top piston ring should come about half-way out of the cylinder bore, and if the connecting rod is too long it may come so far out that it expands and then breaks when the piston goes down again. Another thing we suspect is that the cylinder bore at the top is oversize, as might be caused by using a hone carelessly which would result in chamfering the upper edge of the cylinder bore. It seems to us as if either of these conditions or perhaps both of them are permitting the top ring to expand to the point where it has difficulty in again entering the cylinder bore. If it is the second or third ring that is causing the trouble then we have no suggestions to offer. It occurs to us, however, that you may be shy on lubrication on the cylinder walls, due to excessive oil scraping on account of the construction described. Instead of having the beveled edge at the second ring groove it is customary to have it at the third or bottom ring groove.

Architectural Service

IN giving architectural advice, MOTOR AGE aims to assist its readers in their problems of planning, building and equipping, maintenance stations, garages, dealers' establishments, shops, filling stations, and in fact, any building necessary to automotive activity.

When making request for assistance, please see that we have all the data necessary to an intelligent handling of the job. Among other things, we need such information as follows:

Rough pencil sketch showing size and shape of plot and its relation to streets and alleys.

What departments are to be operated and how large it is expected to be.

Number of cars on the sales floor.

Number of cars it is expected to garage.

Number of men employed in repair shop.

How much of an accessory department is anticipated.

Relining Chevrolet Clutch

Q.—Advise method of applying clutch facing to 1923 model Superior Chevrolet.—Charles Houston, Ottawa, Ohio.

A.—To insure a good job, it is desirable to check up the cone to see that it is truly circular. This is done by mounting the clutch on an arbor and turning it in a lathe. If not truly circular, it can sometimes be brought to shape by tapping it carefully with a lead or copper hammer. The procedure in removing, relining and replacing the clutch is as follows:

Remove the floor board and wire running from the battery to the starter. Remove the three bolts holding the V brace to the engine base and gear box support and remove the V brace. Disconnect the brake rods from pedals and remove the bolts holding clutch release shaft to gear box support and remove clutch release cross shaft together with pedals. Remove the bolts on rear clutch hub drive ring. Remove the four bolts holding the gear box side arms. Care should be taken in removing the shims under the gear box, so that they may be replaced in the same position. Remove one bolt holding the left gear box side arm (on the pedal side) to engine. This permits gear box side arm to spring to one side when removing the gear box, lift gear box up and slide it forward. It may then be removed from the chassis.

A jack should be placed beneath the propeller shaft to hold it in place when the gear box has been removed, turn the flywheel until the hole passing through the clutch hub is at the top, and the clutch spring retaining pin is in line with the hole. The clutch spring will then have to be compressed and the pin will usually drop out when over the hole in the housing; if it does not drop out it may be driven out with a drift and hammer, next draw clutch spring out, remove bolts holding clutch hub to clutch spider and remove clutch hub.

This is necessary, as the hub would otherwise interfere when removing clutch; pull clutch out. Remove nuts holding flywheel to crankshaft flange and with a bar loosen flywheel and remove. It is advisable to mark the position of flywheel on flange so it may be replaced in the same relative position.

Remove flywheel together with clutch spring, anchor stud and place it on two boards nailed to a bench. Separate all parts and clean with gasoline and waste. It is best to obtain new clutch lining from the makers, but if this is not expedient the old lining should be carefully removed and used as a pattern for cutting the new lining. The new leather should be much thicker than the old lining and of uniform thickness.

The most essential point in fitting the new leather is to have it fit tight and true to the cone. If the clutch has been relined it will not work perfectly until it has been worked in. This usually takes some time and during that period it should receive frequent applications of

neatsfoot oil. To fit in new leather, soak the leather in water, then secure one end of the leather to the cone by one copper rivet (rough side out). With only about three-fourths of the leather of the cone, pin the other end to the cone by a rivet and force the leather up onto the cone. It should fit evenly with uniform tension. Drill and countersink the rivet holes, rivet the leather in place, being certain that rivet heads are $\frac{1}{2}$ in. below the leather and well headed on the other side. Allow the leather to dry slowly, as otherwise it will shrink too much and expose the rivets.

The assembling process is as follows: Lift flywheel back into place on the engine. Bolt it back in the same position as removed. Do not tighten any one bolt until all are drawn snug. This removes the possibility of having the flywheel out of true, which would ruin the thrust bearings. Force the clutch back into position. Bolt clutch hub to clutch spider. Draw all bolts up snug before any one is tightened. Put clutch spring back in place and pack with grease. Compress clutch spring and replace clutch spring retaining pin. Lift gear box back into frame. It will have to be sprung past the gear box side arm.

Replace bolt holding gear box side arm to engine. Replace the bolts on rear clutch hub drive ring. Bring all up snug together. Replace bolts holding gear box to side arm. (Make certain that the shims are replaced exactly in the same position from which they were removed.) Replace clutch release shaft with clutch yoke and pedals. Connect brake rods. Replace V brace, connecting gear box support with engine. Refill the reservoir on clutch yoke and grease cups on clutch cross shaft. Oil all working parts. Replace wiring.

Start engine and note whether everything seems to be working properly. If there is a rattle in the clutch drive ring, it will indicate that the gear box is out of line. The shims will have to be shifted or possibly removed. When perfect alignment is reached the rattle will cease.

SPARKS IN THE WRONG CYLINDER

Q. We recently had a very peculiar acting Eisemann combination magneto generator on an Indiana truck. The motor would idle properly and run fast properly when the spark was retarded, shooting heavily as would be expected. As soon as the spark was advanced more than one quarter of the quadrant the motor would begin to miss and if completely advanced would stop with throttle in idling position or pop and bang in muffler if throttle was opened. It would sound as if the wires were interchanged, but their lengths would not permit this and the driver stated that the trouble appeared suddenly. I removed the unit, filed the points, checked equal openings at both cam positions, replaced worn carbon brushes in distributor plate, noted that timing of distributor gear relative to armature was according to manufacturers' marks, cleaned all parts and assembled. I then placed a piece of iron wire in each high tension terminal hole in distributor plate and bent the ends of them within

3/16 of an inch of the magneto frame. By rocking the armature shaft by hand a snappy spark was seen at all wires at the proper time. The strongest spark occurred when the breaker housing was in the advanced position. When the unit was replaced on the motor and timed with points opening at top D. C. on retard, the action was exactly the same as before cleaning. I noticed that with wires No. 2 and No. 3 removed the motor would shoot regularly on the two cylinders No. 1 and No. 4 regardless of spark position. If either No. 2 or No. 3 wire was touched to its plug when spark was advanced, there would be a heavy back fire in the muffler. Removing the generator part of the unit had no beneficial effect on its operation. At this stage of the game another truck belonging to the same concern came along and towed the offender to the company garage in another town. I am still puzzled over the matter and would like to have your opinion on the subject. I keep a permanent file of Motor Age.—Carl W. Spring, Cupertino, Calif.

We believe that the distributor arm was not properly timed, which resulted in the distributor brush not being quite on the segment in the advanced position. We believe that the timing was sufficiently near so that in the retard position the brush was on the segment, but that in the advanced position a spark had to jump a slight distance in order to get to the segment and get to the wire leading to the spark plugs. We also believe that this condition caused the spark to jump along the surface of the distributor cap and burn a track back to an adjacent segment. Then when the interrupter points opened and the spark lever was set in the advanced position the spark would occur while the distributor brush was in between segments. When you had the four iron wires serving to produce four spark gaps there was no choice for the sparks, as all the gaps were alike and it jumped at the proper time at the proper gap. On the engine, however, conditions are somewhat different, for the spark plug which should fire is in the cylinder under compression, while in the other cylinders the spark plug gaps are not under compression so that it induces the spark to go at the wrong cylinder if a leak such as we have described exists. This theory is further borne out by the fact that No. 1 and 4 cylinders fired perfectly while No. 2 and 3 spark plug wires were disconnected. This prevented the leakage path to the No. 2 or 3 segments from taking the spark and forced it to go to the right cylinder. We believe that if you had been able to try a new distributor cap on this magneto that the trouble would have disappeared.

R.P.M. OF ESSEX

Q. Advise the engine r.p.m. of the latest Essex at 45 miles per hour.—Tony O. Berto, Helper, Utah.

The tires are 31 in. in diameter and the gear ratio is 5.6. From this data we figure that the engine turns approximately 2730 r.p.h. at 45 miles per hour.

Safest to Time in Retard Position

Q.—In the Readers' Clearing House of July 31, I noticed on page 34 an article which says 3% is too much advance. I am enclosing a clipping from one of my Jordan instruction books which says that this advance is correct.

A.—The discrepancy seems to be that in one case the setting is made with the spark lever retarded while the Jordan instruction book recommends an advance of 3% in. on the flywheel with the lever in the advanced position. The essential condition in timing any engine having battery ignition is that it be possible to start the engine with the spark retarded without having the engine kick back. Aside from this condition you can have as much advance as desired. For this reason, however, it is customary to have the spark in the retard position occur when the piston has come up on dead center and then has barely started down again. This means that when the spark occurs the piston will be over dead center and the engine will be driven forward rather than be allowed to kick back. The exact amount of spark advance required by the engine varies with the speed and also with the load on the engine, so that it is impossible to state any fixed amount of advance that is right. Of course, in the instruction book the experience has been attained which enable the instructions to be given in this way, so that with the lever in the extreme advanced position and the flywheel 3% in. before dead center the timing could be checked.

CAUSE OF CLICKING PISTON RINGS

Q.—We have recently had trouble with a Maxwell which clicks at high speed when pulling hard. We have installed two Gill oil rings on each side of a Gill service ring and have set the ignition every way possible. We set the valve clearance in different ways between .006 in. and .010 in. and we used various carburetor settings and tried ethyl gas, but failed to eliminate the click. The motor does not miss and the click can only be stopped by pulling out choke but this makes it slow down and the water will boil. We drove the car to Columbus last week and from the time we left the hills we never heard a sound, but the moment we struck the hills coming back the clicking started again. The carbon had been cleaned out just before starting.—John W. Harris, Mt. Pleasant, Ohio.

A.—We have had an epidemic recently of piston ring knocks as reported by various subscribers. This seems to occur after an engine has been thoroughly overhauled and new pistons and rings installed. In cases of this sort the condition is often remedied by filing notches in the top of the upper piston ring so as to allow the explosion pressure to get in behind the ring and hold it out against the cylinder walls. The trouble as nearly as we can determine is due to the force of the explosion compressing the upper piston ring and causing the two ends to strike together. One peculiarity, however, is that the condition seems to be experienced with concentric rings

having step-cut joints. With the eccentric rings and joints cut at an angle the trouble does not seem to be experienced. Another remedy which seems to be effective but does not seem logical, is to have the rings slightly loose in the grooves. This would also seem to allow the compression and explosion pressures to get in behind the rings, so as to hold them out against the cylinder walls. As this condition seems to present itself only in engines which have been recently renewed, it would seem as if the fit of the piston rings against cylinder walls is not perfect, even if it seems to be perfect. If this is the case we can figure that possibly explosion pressure gets between the piston ring and the cylinder wall before it works in behind the ring, and therefore, causes the ring to be compressed and the ends to strike each other. We would like to have some explanation which appears to be more reasonable, but this is the only one we have been able to evolve. In your particular case, of course, it may be that some other condition is causing the noise, although as you describe it as a click we feel that the piston rings are causing the trouble. The trouble occurring on a hill where the pull is harder can be explained in as much as the engine then has more gas in it, due to the throttle being opened wider and accordingly, the explosion pressure is higher. If this click disappears in a thousand miles running or so, it would seem to justify our contention that the fit of rings and cylinders is not perfect at present but improves with use.

HOW TO REVERSE A MOTOR

Q. We are making an electric drill using a starting motor out of a Studebaker car. The starting motor is a Wagner model 154. The drill is finished but we were not successful in reversing the direction of rotation of the motor. Looking at the drive end of the motor it runs clockwise and in order to use it as a drill it will have to run counter-clockwise. Show by a diagram how to change the leads from field winding to brushes so that the motor will run in the opposite direction. We read an article in *MOTOR AGE* some time ago where such a drill was used in building a bridge and we thought we would try this scheme ourselves.—F. P. Herrmann, 1714 W. North avenue, Baltimore, Maryland.

To reverse the rotation of a starting motor it is necessary to reverse the direc-

tion of current through either the field or the armature but not through both. We are accordingly showing connections of the starting motor as it is and as it should be for your purpose. The connections at the left are those which exist at present. We would suggest changing the field connection at the brushes and leaving the live terminals at the ground end of the field winding as they are. You may find that the connections will not reach and it may be necessary to make up connections out of heavy copper strap so as to make your motor check up with the diagram at the right.

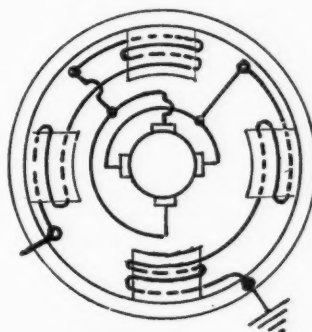
ON COOLING THE WELD

Q. In welding broken frame, after the welding is done, I used to leave it to cool without any liquid or using any cooling device. Would it be better to cool the job quickly?

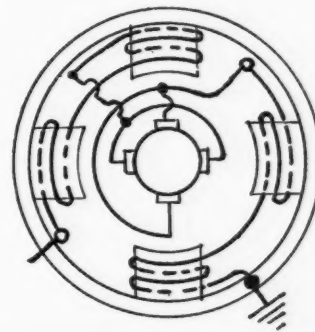
In general the faster steel is cooled the harder it gets, so it would be our opinion that it would be best to let it cool slowly to keep the steel from becoming excessively hard and brittle.

Q. I understand that most front axles are built of nickel steel. I wonder how the nickel element in the steel would be taken care of under oxy-acetylene flame when melting the two portions together?—T. Hirakawa, 1007 E. Union Street, Seattle, Wash.

The front axle is one of the most vital parts of the automobile and is very carefully treated. Proper heat treatment in the average automobile shop is very nearly out of the question, so we doubt if it is wise to try to weld a broken axle. When an axle has been bent it is preferable to straighten it cold if a press powerful enough is available. In some cases axles are heated somewhat in order to make it easier to straighten them and while this may be found satisfactory it is due to the fact that the axle has a large factor of safety, so that while the strength is reduced it is still sufficient for ordinary service. Cases have been known, however, where an axle straightened hot gave away again when the car was going around a curve at high speed. The possible danger this involves can easily be seen. We accordingly feel that welding a front axle is a practice that should not be encouraged.



CLOCKWISE CONNECTIONS



CONNECTIONS FOR COUNTER CLOCKWISE ROTATION

101189

Part of a Page on Paige

Q. What would be the best way to install a cutout on a Paige 70 sport car to get a good loud hollow sound?

Installing the cutout in the exhaust pipe between the engine and muffler should give satisfaction.

Q. Send power curve of the Paige 70 motor.

This curve is not available.

Q. Do other cars use this same engine?

This engine is a model 9A Continental and we do not find in our specification tables any other cars using the same model.

Q. Is the large Case Six engine the same? Its bore and stroke is the same.

We think you are mistaken in this, for the Paige uses a model 9A Continental, in which the bore and stroke are $3\frac{3}{4} \times 5$, while the Case car uses model 6T Continental engine, in which the bore and stroke are $3\frac{5}{8} \times 5\frac{1}{4}$. In the Case car, in which the model 8R Continental is used, the bore and stroke are respectively $3\frac{3}{8} \times 4\frac{1}{2}$ inches.

Q. What is the approximate speed of the Paige car?

We would estimate 70 miles per hour.

Q. When was this Paige built? The chassis number is 141595 and the motor number 139326.

1923 Paige cars model 70 began at number 137500, so we assume that the car you mention was made some time in 1923.

Q. Are the Timken axles in this car the same as used in the Cadillac or are they as heavy?

Data on this would have to be obtained from the axle factory. Generally the axle is designed so as to be suitable for the car under which it is placed. From specification tables, however, we notice one difference, in that the Cadillac axle is full-floating while the Paige axle is semi-floating.

Q. What records does the Paige hold for stock car speed?—Alfred F. Gurnett, Fairfax, Iowa.

On page 35 of the April 20th, 1922, issue of MOTOR AGE we have found an article in which it states that a Daytona model Paige driven by Eddie Cooper, drove 10 miles at 93.24 m.p.h. at San Carlos, California.

WHAT KIND OF A RACE CAR?

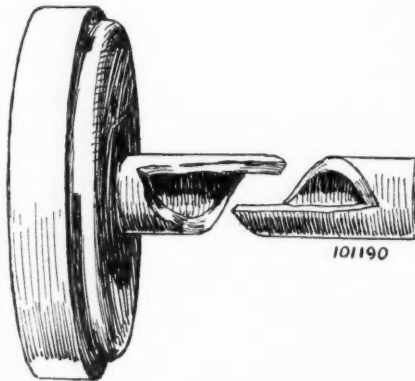
Q. I am building a racing car. What make of light weight pistons would you advise me using, also give the proper clearance? Also advise what kind of piston rings I should use? Would you advise me to install a high speed camshaft and where can I get such a camshaft? What kind of valves would you advise to install and would it be necessary to enlarge the intake and exhaust ports.—Elmer Stanley, 100 E. 30th Street, Kansas City, Mo.

You do not state the kind of a car you are using to build into a race car. It is contrary to the policy of MOTOR AGE to recommend or condemn any article of automotive equipment. Cast iron pistons are usually fitted with a clearance of .001 in. per inch of cylinder diam-

eter, while light weight alloy pistons are usually fitted with .002 inch clearance for each inch of cylinder diameter. The exception comes in the case of light weight pistons of split skirt construction and here the recommendation of the piston maker should be followed. With alloy pistons it is generally considered advisable to use a concentric ring rather than the eccentric ring, which is thin at the end. A narrow ring about $\frac{1}{8}$ inch wide is also frequently used. For racing engines the number of rings is often reduced in order to cut down friction, there being usually two above the wrist pin instead of a greater number. Overhead valves are usually employed on racing cars, but as you do not mention the make of car we do not know whether you can use conventional cylinder heads which are on the market or not. Special construction, however, is desirable in regard to camshaft and ports. Additional information can be obtained from concerns specializing in racing equipment. Names of these concerns will be given by letter.

BROKEN BRAKE DRUM MAKES CAR SHOW LOSS OF POWER

Q. On page 36 of the July 24th, 1924, issue of MOTOR AGE you published a question that I asked about a Ford car that would not pull in low gear. Since then we have found that the hub of the brake drum was broken and this caused the trouble. We are sending you a wooden imitation of this brake drum hub showing exactly how it was broken. This is sent in order that you may thoroughly understand the cause of the trouble. It was a surprise to us to know that this car was driven as much as it was and pulled as well as it did in this condition. The car was all right in high gear and pulled fairly well in low gear up slight grades. It pulled so well in low gear that you would hardly notice the difference except



pulling a real steep hill. The way we found the trouble was in trying to back the car up a hill for it would hardly pull at all in reverse and yet pulled fairly well going forward. In studying the break you can see why this was so, for in pulling forward there was a tendency for one piece to drive the other, while going backward there was a tendency for the hub to elongate or increase in length thereby producing a great deal of friction.—Carlos Farris, Tilford, Ky.

This is certainly an unusual case and we are glad that you gave us all the details. The illustration shown is made up from your wooden brake drum hub and should be of interest to other MOTOR AGE readers.

PUTTING THE STARTER CURRENT BACK IN THE BATTERY

Q. Can you tell me how long it takes a generator charging at the rate of 10 amperes to put back into the battery the current or amperage it takes to start the car one time when the battery and starter are in good condition?—O. E. Heller, 4113 Cass Avenue, Detroit, Mich.

The first rush of starter current may be in the nature of from 300 to 500 amperes, but as soon as the engine begins to rotate the starting current drops off to about 125 amperes. If we consider that the average starting current is 150 amperes or 15 times the charging current, then the generator would have to run 15 times as long as the starter operated in cranking the engine. The battery, however, is not 100 per cent efficient, so we must allow for this. For that reason if the starter is operated for 3 seconds the engine would have to be run a minute or more with the generator charging ten amperes to replace the current taken from the battery. We must also consider, however, that a battery discharges slowly by itself, so that averaging up these conditions the generator will have to do more than merely replace the starter current.

WHY NOT TRY TNT

Q. Wish to know by letter how much ether to put to each five gallons of gas to make a car pull well and would also like to know if it will hurt the motor. Will regular drug store ether be O. K?—Powerful.

Ether has no advantage as far as producing extra power is concerned. It is very volatile and if mixed with the gasoline would evaporate in a short time so that there would be no advantage by using it this way. Its only advantage is for easy starting in winter. Then one part of ether should be mixed with four or five parts of gasoline and this mixture used for priming the engine. Care should be used, however, not to put too much in the engine, as the explosion of ether is very violent and may damage the car. Cases have been known where an engine primed with ether exploded and did great damage.

OIL STOPS THE FLOW OF JUICE

Q.—Can you advise what condition it is which necessitates frequent sandpapering of a Ford generator to insure its charging? What remedy can be applied to render sandpapering unnecessary?—J. J. McGuire.

A.—Excessive lubrication of the bearings by means of oil put in at the oiler at the rear of the generator causes oil to get on the commutator. This is absorbed by the brushes and forms an insulating surface where the brushes make contact with the commutator. The sandpapering merely removes a portion of the film from the commutator so that better contact is made temporarily. Oil then works out of the brushes again and the sandpapering is required to make the generator function. The remedy is to put in a new set of brushes and then go easy on the oiling or practically refrain from lubricating this rear bearing except when the generator is torn down and the bearing is packed in heavy grease or vaseline.

BOOSTING ACCESSORY SALES

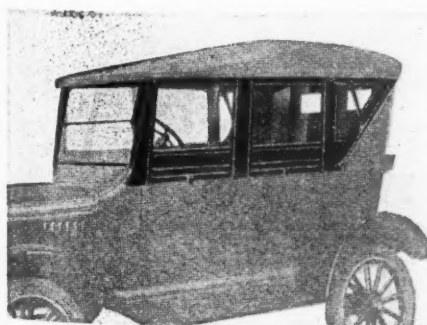
"CAMPALL" is something designed to appeal to campers. It is a rubberized blanket made by the Hodes-Zink Mfg. Co., Fremont, O., and it sells for \$3. The size is 54 by 72 in. and it can be used for keeping equipment clean and dry. There are three grommets in each of the narrow sides through which ropes can be passed to make the wrapping tight and secure. The double coated rubberized fabric is a du Pont product specially developed for the purpose. All four sides of the blanket have turned, stoutly-stitched edges.



Rubberized camping blanket

The Close Tite for Winter and Summer Use

This consists of an enclosure designed for Ford, Chevrolet, Overland, Dodge and Star cars and is designed for winter and summer use. It is an application of the idea of sliding curtains in steel channels, and it is said that the owner can change from an open to a closed car in a few seconds by merely raising or lowering the sliding curtains. The price for Fords varies from \$33 to \$48 according to the model; for the Star it is \$48; for the Chevrolet from \$35 to \$50; for Dodge and Overland Four, \$50. The manufacturer is the Longdin-Brugger Co., Fond du Lac, Wis.

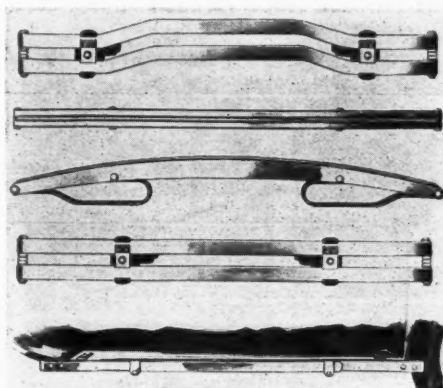


The Close Tite for small cars

McKay Bumpers and Side Guard

A complete line of bumpers is announced by the United States Chain and Forging Co. of Pittsburgh, Pa., makers of McKay tire chains. The bumpers are made with a bead end construction which

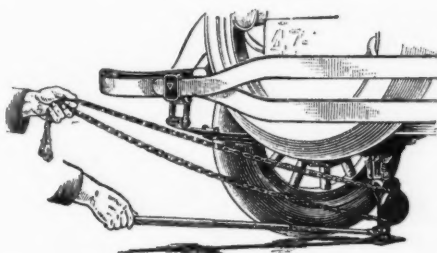
is said to absorb end shocks. The bumper proper and the bracket are connected by a hinge which allows a certain freedom of motion in taking blows from any direction. Bracket arms are of heavy spring steel, heat treated and curved to give extra resiliency, so that both bumper and bracket serve to absorb the shock. In addition to the line of bumpers, a side guard to protect the running board is available.



McKay bumpers

Weed Chain Jack

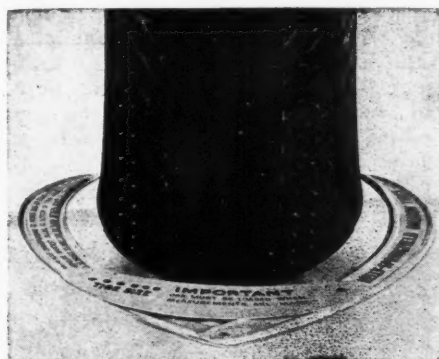
The Weed Chain Jack is designed to facilitate lifting a car without the necessity of getting down in the mud to put the jack under the axle. The jack is provided with a long telescoping handle for locating it under the car, while the hoisting operation is performed by operating the chain. Pulling the chain one way raises the car, while pulling the other chain lowers it. The jack is made in three sizes: 8 in., 10 in. and 12 in., the price being \$6. The maker is the American Chain Co., Bridgeport, Conn.



A Caliper for Measuring Balloon Tire Pressures

The Kelly-Springfield Tire Co., 250 W. 57th street, New York City, has developed a new type of balloon tire caliper known as the Kelometer, to be used for maintaining balloon tires at proper pressures. The instrument is an enlarged form of a machinist's outside caliper made of light but rigid stamped metal and provided with a series of holes in the regulating cross-piece which set the outer points or jaws at the proper width for any corresponding size of tire. This width has been calculated to apply to

the Kelly-Springfield full balloon and balloon type of tires and the measurement is made at the greatest width of bulge near the point of road contact. All that is necessary is to set the pin in the proper cross-piece hole corre-

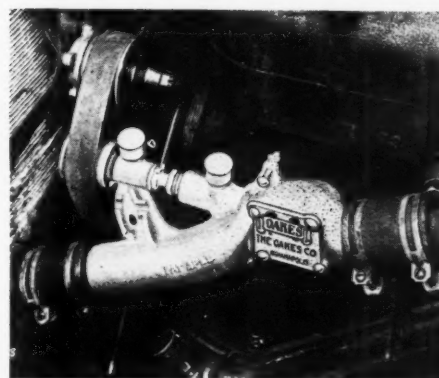


Caliper for measuring balloon tire pressure

sponding to the size of tire used and, with the car loaded to its normal content, to pump in or let out air until the calipers fit easily over the bulge of the tire. The instrument thus indicates the condition of the tire, taking into account the air pressure and the load.

Oakes Water Pump for Fords

A new water pump for Ford cars and trucks has been announced by the Oakes Co., Indianapolis, Ind. It is supported between the regular Ford hose connections and operated by the Ford fan belt. It is designed to give to the Ford thermosyphon cooling system increased water velocity. The pump is accessible, and, it is said, requires no attention other than a turn of the grease cups once a month. Among the advantages claimed for the pump by its manufacturer are: low power consumption; long bearing life made possible by two long bushings of bronze at pulley end with grease reservoir between; impeller of three-blade centrifugal type; circulation assured by low position of pump even with low water level. The price is \$6.50 (\$7 west of Denver) f. o. b. Indianapolis.



Oakes pump for Fords

GETTING MORE OUT *of the* SHOP

MORE and more is the car-owning public coming to demand quality in automotive maintenance. The feeling of security that comes with the knowledge that work has been well done and can be depended upon to stand up when it is needed most is worth a great deal to an automobile owner. Those shops which have the reputation for turning out work of this character are cashing in on their reputation; for the other kind of work seldom gains a repeat order and the next time the car owner is in trouble he takes his automobile elsewhere.

Quality in work is attained not only by the use of skillful mechanics, but by the

customer's establishment determine the volume and pressure of the air necessary to secure the correct atomization.

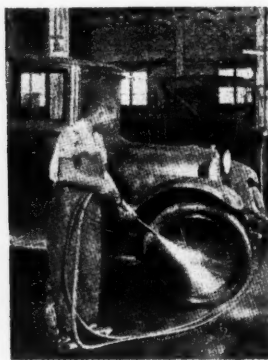
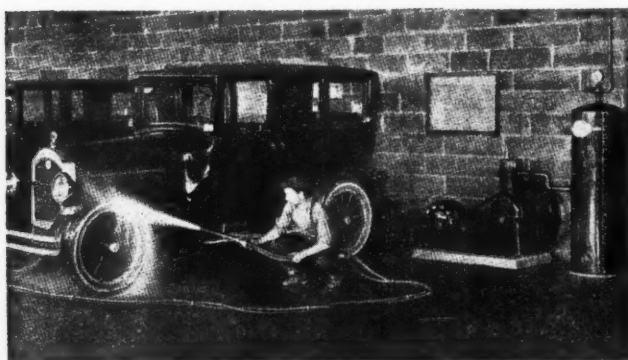
In order to determine the size of compressor, the size of the air and water jets to be supplied in the washing nozzle, and the air pressure to be carried, the company supplies an instrument known as the Flow Meter for making a survey of the customer's water conditions, designed to measure the "water constant" when the amount of water is being used that would flow through the Curtis nozzle.

The Flow Meter comes fitted with a removable jet plug having a calibrated

ment required to accomodate individual needs. All of the outfits incorporate either a single or double cylinder Curtis compressor, controlled splash oiling type, with sight feed regulation of cylinder oiling, the compressor to be water cooled, complete with flywheel driving pulley and high and low level oil filling gage; governor to maintain the required pressure, in the tank; air receiver of the size specified, suitable for 100 lbs. working pressure, complete with pop safety valve, air gage and drain cock; necessary piping and pipe connections between compressor and tank for approximately 5-ft. centers; necessary single leather endless drive belt of width specified for 6-ft. pulley centers; nozzles as specified, each with 20 ft. of air hose, 20 ft. of water hose and flow meter; motor as specified. This makes a complete outfit with the exception of the air piping from the tank to the point where the nozzle will be installed and the water pipe line. The installation of the outfit is not included in the price.

The Auto Tipper

This device consists of a pair of simple frames, each equipped with a long steel screw. The frames are placed on the ground and the car driven over them so that the wheels rest on each frame. Then the car is tipped on its side to any angle up to 40 degrees, and, it is claimed, the heaviest car can be tipped to this angle in 5 minutes. One section can also be used to raise the front end of the car to adjust the steering assembly or remove the front wheels. The Auto Tipper is made of high grade open hearth and cold rolled steel. When not in use it folds up into a small space, the space occupied being 15½x78x2 in. It is manufactured by the Auto Tipper Co., St. Louis, Mo.



Views showing the Curtis Air Mist Car Washing System in use

employment of the most up-to-date equipment in the shop designed to facilitate performance of the job and to enable it to be done more cheaply than it could be done otherwise. If the work can be done in less time with the use of modern equipment than without it, it naturally follows that it can be done more cheaply. A part of this saving in cost can be passed on to the car owner and the proprietor of the shop can at the same time realize a snug profit. Thus both sides are satisfied and the volume of business for the shop grows. By having the right kind of equipment to do the work you will make things much easier for everybody concerned.

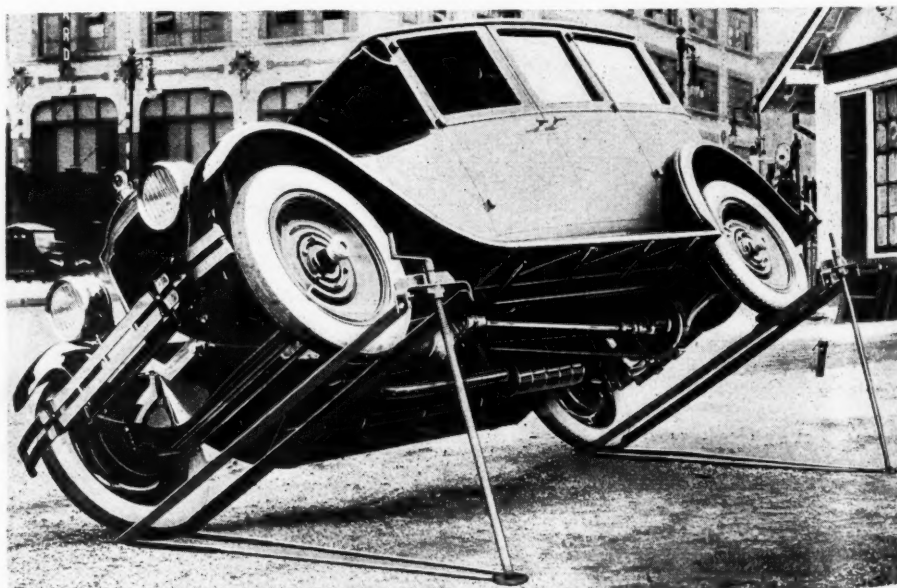
Curtis Air Mist Car Washing System

Primarily this system is used for washing the chassis, including the underside of the mud guards, springs, axles, steering knuckles, and other places difficult to reach with the ordinary sponge and brush method. It was designed with a view to evolving something that would soak the dirt accumulation quickly without injury to the finish. Use is made of a combined air and water spray, the principle being to create a fine mist under pressure to be absorbed quickly by the dirt, with not enough solid water stream to drive the grit into the finish.

The manufacturer, Curtis Pneumatic Machinery Co., St. Louis, Mo., worked with the objective of securing a correct atomization of air and water, and with the idea that the volume of water and the pressure of water available in the

orifice. If it is desired to test for a one-nozzle system the plug is not removed, but it is if a two-nozzle system is to be tested. Tests are made at 30-minute intervals over the entire period of day or night during which it is expected to do car washing.

The Flow Meter is sent for \$5 which is refunded when the instrument is returned with a report of the test or credited on the purchase of the complete outfit, the prices of which range from \$736 to \$2,100 according to the equip-



The Auto Tipper, used for facilitating the task of the man working on the car

EDITORIAL

An Industry "25 Years Young"

THE rise of the automotive industry, as viewed in retrospect, offers a story which teems with most absorbing features, a story replete with romance and one which is not without its thrills for all who are connected in any manner with this vast field of commercial enterprise.

Soon "25 years young," we might say, the automotive industry has made truly wonderful progress, standing today as one of the world's foremost economic institutions and with a future yet before it so broad as to defy the comprehension of the best prophets.

To back-trail this industry's steps over the quarter-century period is a fascinating indulgence. Changes have been many and evolution has come fast. A glimpse of some of the pictorial crudities of its infant days is offered in this issue of MOTOR AGE, and while this is but a glimpse it might be accepted as a sample of something much better to come from another source.

This coming December "The Automobile Trade Journal," in commemoration of the industry's birth, is to issue a magnificent edition wherein a great array of the early-day productions, pictorial and otherwise, will be presented along with an elaborate historical account of the industry's development from that time down to the present. It will be called the "Silver Anniversary Number" and will precede the two big national shows which next spring will complete their twenty-fifth year of existence.

Prepare Now for Christmas Sales

THE Automotive Equipment Association recently sent a questionnaire to its manufacturing members asking if they expected to pack any of their automotive products in Christmas boxes or wrappers for the holiday trade. Out of the first 35 who replied, 32 stated that they would have Christmas packages. One would not and two were undecided.

The significance of this is that the manufacturers are prepared to do more this year than ever to help promote the idea of giving automotive articles for Christmas presents. At the same time the A. E. A. is lining up its forces for an aggressive national campaign centered about the slogan, "Give Something for the Car This Christmas." Details of this campaign are given in an article in another part of this issue of MOTOR AGE.

The volume of Christmas business done by the individual dealer will depend to a very great extent upon the effort he puts into the campaign. With right kind of educational publicity he can direct a substantial part of his community's Christmas money into his own cash drawer. But now is the time to start.

Detours

AN automobile dealer complains that a motor club of which he has been a member has not been active enough in protesting against the many detours that exist on the improved roads in his section of the country. He declares he is through with the club until it vigorously attacks this important problem.

It is lamentably true that many of our improved roads which were supposed to have been completed some years ago are marred by difficult detours that take all the joy out of motor-ing. Highway departments in some of our states have shown commendable progress in the construction of roads, but have been miserably slow to eliminate detours and gaps that stand

in the way of a completed continuous highway. Highway engineering has not given proper attention to provisions for the continuous flow of traffic during construction or repairs. The first consideration of the engineers should be to keep the traffic moving in the most comfortable and expeditious manner.

In many cases the expenditure of a relatively small sum for temporary work or a slightly increased cost of construction would greatly facilitate traffic and save many times the cost of wear and tear on vehicles that now have to flounder through almost impassable detours.

Used Car Plans

ALL is not well with the many heralded plans for the solution of the used car problem. The news columns tell from time to time of the closing of this or that co-operative market which started out with the glamorous promise of a cure-all. And now the automotive testing laboratory at Chicago has closed. This was a scientific establishment where the exact mechanical condition of a used car could be ascertained and certified to. It was possible for the dealer to obtain a certificate from this laboratory showing exactly the condition of the used car. But very few dealers did, and so the institution was abandoned for lack of support.

This laboratory was established by the Chicago Automobile Trade Association, one of the strongest dealers' organizations in the country. But it was not properly supported by the members of the association. It was not given a fair trial. It was established with the idea that extensive educational advertising would be carried in Chicago newspapers to tell the public what it was and why it would help them to buy good used cars. It was proposed to create in the public mind the thought that here was a means through which a used car could be bought with confidence. The advertising campaign was started but not carried out. The plan fell flat almost from the start, just as other used car plans have fallen.

And so the used car is still a "problem." And the only solution still lies in recourse to the fundamental principles of merchandising, the most important of which is, "Buy right and sell right." The dealer who decides for himself that he will handle used cars as merchandise, something that he buys for resale at a profit, has devised for himself a used car plan that can't be beat.

Resta Gives Up His Life

THE death of Joe Boyer at the wheel of his magnificent racing car was followed quickly by the passing of Dario Resta under similar circumstances. It matters not that these two veteran experimenters with the speed and stamina of motor vehicles lived for periods more or less brief after the occurrence of the fatal accidents which checked their careers. It is no error to say, as they would like to have it said, that they died at the wheel.

Both knew the danger of the game and both loved it well. They knew the contribution to engineering science that their daring made possible. They knew very well that the constant improvement of the motor vehicle was not possible without the severe tests to which metals and designs could be put only on the laboratory of the race track. They were not merely daring drivers. They were skilled men who keenly appreciated every thing that was done to add endurance and speed to the cars they drove.

Bright Prospects for Fall Trade Seen

Present Buying Not Large But Holds to a Fair Level

Dealer Stocks, Generally, Are About Depleted of Old Models Where New Designs Appear

NEW YORK, Sept. 8.—The first week of September shows little change from the automobile producing schedules followed during August. There may come a speeding up later in the month, but that will depend solely upon the development of retail demand. However, bright prospects for fall business appear in sections of the country where buying interest has been at low ebb for months, producers will not increase operations until definite assurance is given that sales can actually be made there.

This hesitancy will continue to a great extent during the remaining months of the year, the stepping up of manufacturing schedules following very closely the strengthening of the retail sales curve. Present buying is going along on a fairly good level for the season but it is not exceptional in its volume.

Dealers' stocks, except in a few instances, are virtually depleted of old models, where new models have been brought out to supplant the old, and no surplus of cars is reported in other cases where there has been no change in design. The trade has only such stocks on hand as it feels justified in carrying.

Effect of Slower Output

This clearing up of a condition that appeared formidable earlier in the year has been due to the slowing up in plant output, reducing production figures for the last three months much below the average for the preceding five and below the level of last year's operations for the same period.

The 268,477 cars and trucks produced in August brings the total for the eight months of this year to 2,529,517 which is 184,910 less than the output for the corresponding period a year ago. Inasmuch as none of the last four months of 1923 dropped below 300,000 in production there is little possibility that this year's total will closely approach that of last year. Only unprecedented plant activity during the rest of the year could bring the total for the twelve months to the 4,000,000 figure.

The foreign market for American made cars will show notable improvement with the adjustment of economic conditions in Europe. While there may be no immediate increase in the absorbing power of overseas buyers, it is felt that by the beginning of next year American manufacturers will be warranted in augmenting their exports.

Farmer Is Canada's Largest Owner

OTTAWA, Ont., Sept. 8.—A recent analysis of Canadian car registrations showed that car owners were divided among classes under the following proportions:

Farmers, 37 per cent.
Salesmen and travelers, 16 per cent.
Business men, brokers, etc., 16 per cent.
Professional men, 8 per cent.
Gentlemen of no occupation stated, 7 per cent.
Laborers, 4 per cent.
Contractors, 3 per cent.
Liverymen, 3 per cent.
Miscellaneous, 6 per cent.

Chevrolet Introduces New Motor Merchandising Plan

DETROIT, Sept. 8.—A new merchandising plan embodying interesting departures and a strong tincture of the savings bank deposit system has been adopted by the Chevrolet Motor Co. for immediate introduction. The system, which is copyrighted, is called the Chevrolet Six Per Cent Purchase Certificate Plan.

Under its arrangements the person who desires to buy a car at a future date is given a purchaser's certificate on a down payment that can be as low as \$5. When a third of the purchase price on the model desired has been paid in the holder receives the car and is given a six per cent interest credit on the sum the dealer has collected.

Another benefit of the plan is offered to persons already owning one of the Chevrolet company's cars. Such certificate holders will be given a credit of 6 per cent on the amount spent with the dealer for accessories, service and repairs, the credit thus applying as part payment on the new model to be purchased. In case a certificate owner desires to cancel his certificate he is entitled to do so and his money, without interest, will be returned, the factory announces.

SHOW LARGE MOTOR EXHIBIT

SACRAMENTO, Cal., Sept. 5.—The largest collection of automobiles of all makes ever assembled under one roof in Sacramento valley is greeting visitors at the annual California State Fair, held here from Sept. 1 to 7. The automobile exhibit is housed in a large tent that accommodates 100 machines and an adjoining tent for trucks and accessories. There are several makes and models on display not regularly represented in this territory.

Record Breaking Volume of Orders Reported by Nash

September Demand Best for This Month in History as Factory Nears Peak Output

KENOSHA, Wis., Sept. 6.—Indications pointing to a record-breaking volume of sales are seen by E. H. McCarty, General Salesmanager of The Nash Motors Company, who today made public the fact that Nash now has on hand more orders than ever before at this time of year. "Not only does the volume of orders for the new Advanced Six and Special Six Series exceed any previous September in the company's history," says Mr. McCarty, "but it also surpasses any single month of the last six months period of all previous years."

"The reception accorded the new Nash series by the public," according to the general sales manager, "has been highly gratifying, even greatly exceeding factory expectations." Since the new Nash lines were announced it is stated that requests for information about the Nash franchise and actual applications for territory have been received from 378 dealers in all parts of the United States.

Nearing Peak Production

"We have every reason to be optimistic at this time and look forward to excellent business the rest of the year," says Mr. McCarty. "As far as Nash is concerned the buying season is on in full swing and our problem now is to supply the demand. The Kenosha factory is rapidly reaching the point of peak production and it will not be long before that stage has been attained. Our records show that the demand has been increasing constantly since the introduction of the new lines and there is no reason to believe that it will not continue for an indefinite period. Consequently we are preparing to respond to the full limit by taking whatever steps may be necessary to increase our production."

"Orders for the Nash Special Six Series made at Milwaukee also are exceptionally heavy," said Mr. McCarty, "but because of the tremendous task of changing the plant over for a six-cylinder product from a four basis, the Milwaukee production will naturally be slower to reach its full capacity. However, operations there will be stepped up now to meet the heavy demand."

ADD TO TRUCK LINE

GARY, Ind., Sept. 8.—A new one ton delivery express listing at \$1,590 and known as model WLD has been added to the line of trucks manufactured by the Gary Motor Corp.

155,000 Cars Produced by Dodge Brothers in 9 Months

Retail Sales for Period Ran 142,000 Units, Being Handled by 3,500 Dealers

DETROIT, Sept. 8.—In the nine months ended July 1 Dodge Brothers manufactured 155,000 cars and on that date had sold 142,000 at retail. Against 16,000 in stock available for delivery there were more than 12,000 unfilled signed retail orders in the hands of the company's dealers. In making these sales Dodge Brothers dealers, 3,500 in all, had only 15,400 used cars on hand July 1.

This proof that the Dodge Brothers dealers have not been overstocked this season is contained in a booklet, "The Sound Progress of Dodge Brothers Business," issued by the company, in which President F. J. Haynes makes the following statement:

"During a period when the general trend of the automobile business seemed quite definitely downward and accumulation of cars in dealers' stocks was general, Dodge Brothers were marketing the largest production in their history with no substantial accumulation of cars. In fact, for these nine months the greatest production ever for Dodge Brothers cars we have had, we have had, week for week, a consistently smaller number of cars in the hands of our dealers than for any other corresponding period.

"As an index to the manner in which this unusual retail business has been conducted, it is interesting to note that on July 1 there were only 15,400 used cars distributed among our 3,500 dealers. This shows very clearly that our retail business is uniformly on a clean, profitable basis."

STROMBERG NOTES IMPROVEMENT

CHICAGO, Sept. 6.—An improvement in business during the present quarter is noted by officials of the Stromberg Car-buretor Co., which reports net profit of \$166,404 for the second quarter, equal to \$2.21 a share earned on the 75,000 shares of capital stock outstanding, after the usual deductions. In the first quarter the company earned \$2.72 a share, so that for the first half net profits were equal to \$4.94 a share, against \$8.27 in the first half of 1923.

The general balance sheet as of June 30 showed current assets of \$1,961,447, of which \$848,045 was cash, and current liabilities of \$227,875, leaving a working capital of \$1,733,572.

MOON DEALER MOVES

ST. LOUIS, Mo., Sept. 1.—The Gamache Motor Car Co., Moon dealer has removed to its new home at 5617 Gravois avenue. Formerly it was located at 6829 Michigan avenue.

Says Motor Car Is Business Boon

TORONTO, Ont., Sept. 8.—A. S. Crighton, secretary of the Canadian Men's Association, disagrees with the reported statement of the secretary of the Quebec Retail Merchants' Association that automobiles injure business by reason of the fact that people are spending more money on them than upon merchandise.

"My own opinion," says Mr. Crighton, "is that the use of motor cars has led to greater circulation of money. Business is better on account of automobiles than if there were no such luxuries. It is said that a great many persons can't afford to purchase automobiles. There is that about it, of course. It works both ways. Some people buy cars who haven't any right to them and naturally they cannot pay their debts, but bills are better paid than they were before there were any cars.

People have more money.

Excellent Sales Prospects Seen by Moon President

DETROIT, Sept. 8.—Stewart McDonald, president of the Moon Motor Car Co. of St. Louis, who has been in Detroit several days completing negotiations with the Continental Motors Corp. for his company's requirements for 1925, reports a very decided increase in the business of his company during the past few weeks and is of the opinion that the last six months of the present year will exceed that of 1923, which was one of the banner years of the company.

"Our business shows every indication of being much greater next year than this has been," said Mr. McDonald, "although the last six months of the present year will exceed the same six months of 1923, we have just completed laying out our schedule with the Continental Motors Corp. for our motor requirements for 1925. This will be larger than our 1924 schedule by 25 per cent and personally I cannot see anything but extremely good prospects for business during the next 12 months."

ALTER ALTOONA SCORING

ALTOONA, Pa., Sept. 8.—Following protests of positions in the Labor Day speedway race, there has been a recheck of the scoring which has changed the placing of Tommy Milton and Fred Comer, the latter being given second place. The official finish, following the recheck, is as follows: Murphy, Comer, Milton, Shafer, Cooper, Mourre, Fengler, McDonogh and Hartz.

Report Holds Hope That Fall Trade Will Exceed Last Year's

Decided Tone of Optimism Carried in N. A. C. C. Monthly Survey of Retail Conditions

NEW YORK, Sept. 8.—The monthly survey of retail trade conditions as prepared for the directors of the National Automobile Chamber of Commerce is of a decidedly optimistic tone. This report, compiled from data furnished by local trade associations and chamber correspondents, holds out hope that fall business this year may surpass that of last autumn, in the opinion of dealers interviewed. With some exceptions, a considerable improvement upon the summer months is expected.

Closed car demand at the present time is said to be on the upgrade, with sport models declining and the roadster type maintaining its usual sales volume. In several of the mid-western cities summer sales in both cars and trucks exceeded those of the corresponding period last year.

In the truck field, the scouts report that prospects for the light types are better than last fall in Cleveland, Pittsburgh, Harrisburg, Charlestown, Kansas City, Fargo, Atlanta, Chicago, Des Moines, Omaha and Portland, while heavy duty vehicles are expected to hold up to the demand of last fall.

J. F. Lynch Resigns Kissel Factory Post for New Field

HARTFORD, Wis., Sept. 8.—The Kissel Motor Car Company through its president, G. A. Kissel, has announced the resignation of J. F. Lynch, who for the past five years has been Director of Sales for that company. This move on the part of Mr. Lynch comes as a result of his recent decision to go into partnership with Oscar M. Nelson, the present Kissel distributor in Minneapolis. The resignation was effective Sept. 1.

In making this change, Mr. Lynch is returning to his former stamping ground as it was in St. Paul back in 1910 that he first became connected with the Kissel Company as branch manager in that territory.

After selling Kissels for a number of years he was induced to join the factory organization of which he has been a member since 1916 and three years later was appointed Director of Sales.

The new Minneapolis distributing firm for Kissel will be known as Nelson-Lynch, Inc., with headquarters in the present salesrooms on Harmon Place.

TO ERECT ADDITION

BEAUMONT, Tex., Aug. 14.—San Jacinto Motor Co., which has been incorporated here lately with \$60,000 capital, will erect an addition to their plant here.

Creditors Making Effort to Revive Haynes Company

Special Committee Given Time to Work Out Plans Before Hearing of Bankruptcy Plea

INDIANAPOLIS, Sept. 8.—Michael Gesas, spokesman counsel for the petitioners who asked for the appointment of a receiver for the Haynes Automobile Co., of Kokomo, at a hearing before Federal Referee in Bankruptcy Harry Sheridan, at Frankfort, Ind., Sept. 4, said that creditors who brought the suit were willing to give the Creditors' Special Committee additional time to work out plans for the rejuvenation of the Haynes company. The hearing in Federal court set for Sept. 4 was therefore put off one week. It will be before Judge A. B. Anderson in Indianapolis if he returns in time from his vacation.

It is understood that the committee's plan for reviving the Haynes company would put a nationally known automotive executive at the organization's head. The plan is to be taken before the court here for ratification.

Several stipulations were made in the agreement in court on Sept. 4. It was agreed that a restraining order should be entered to prevent the company from encumbering the property, but the service plant would be continued in operation and cars on hand sold at prevailing prices. It was agreed, further, that all money received by the company be placed in a special depository and all checks be signed by Earl B. Barnes, of Kokomo, who would have complete charge.

Hopes for Success

"We have hope that a plan for reorganization may be worked out that will be agreeable to the creditors and that the company may continue to hold the high opinion of the public as in the past," said Mr. Gesas, appearing for the three creditors who brought the bankruptcy action in Indianapolis on Sept. 3.

The bankruptcy petition was filed in the names of Thomas J. and B. F. McIntyre and H. Merrifield, representing claims of the Chicago Tool and Kit Manufacturing Co., operating as the Grinding Wheel Clearing House of Chicago. It was set forth that the indebtedness of the Haynes company totals \$4,602,000, with assets of \$2,602,000, and that the plant had been operating at a loss of \$60,000 a month since January.

CLOSED CARS INCREASE

FORD, Ont., Sept. 8.—Closed car business in the fiscal year just closed by Ford Motor Co. of Canada, Ltd., showed a large increase over the former year, according to a company statement. The coupe sales increased 35 per cent, and the two sedan models increased 118 per cent.

Drives 3193 Miles Without Stop

ST. LOUIS, Mo., Sept. 8.—W. G. (Cowboy) Seeley, who set out in an Oldsmobile six touring car to establish a new non-stop endurance record here, completed five days and five nights, 120 hours, of continual driving, having traveled a total of 3193 miles.

The car was driven at an average speed of 26.6 miles per hour during the long run and finished in splendid running condition.

Seeley is a stunt performer. The cost in this instance was borne by the De Luxe Automobile Co., Oldsmobile distributors in St. Louis, the Roxana Petroleum Co., whose oil and gas he used, the Firestone Tire Co., and the Philadelphia Battery Co.

Seeley was fastened into a leather harness at the start of the drive and chained and handcuffed to the wheel.

Willard C. Lipe, Executive of Gear Company, Is Dead

SYRACUSE, N. Y., Sept. 8.—Willard C. Lipe, first vice-president and one of the pioneers in the Brown-Lipe Gear Co., died last Friday night at Washington, D. C., after an illness of several months. He was 63 years old. Mr. Lipe became associated with his brother Charles and Alexander T. Brown in business enterprises in the early '80's. The Brown-Lipe Gear Co. had been organized by Mr. Brown and Charles Lipe in 1880 to make gears for bicycles. Charles Lipe died in 1887 and from that time Willard Lipe was active in the affairs of the company.

With the coming of the automobile the Brown-Lipe company turned its attention to automobile gears and differentials and soon established itself as one of the leading concerns in the industry. Mr. Lipe and his associates later organized the Brown-Lipe-Chapin Co., which manufactured differential gears, while the Brown-Lipe Gear Co. restricted its production to transmission gears. The Brown-Lipe-Chapin Co. was sold to General Motors Corp. in 1923. Mr. Lipe was widely known for his charitable and philanthropic work. His serious illness began last January with an apoplectic stroke.

PRESENTED WATCH

ST. LOUIS, Mo. Sept. 8.—Edward C. Meissner who recently was named president of the Cleveland Motor Sales Co., Cleveland distributor in St. Louis was presented with a gold watch and an Elk's tooth by members of the Police and Fire departments of Terre Haute, Indiana following his resignation as president of the Board of Public Safety of Terre Haute.

Canadian Motor Exhibit Is Attracting Much Attention

Building Housing 48 Makes of Cars at Toronto Affair, Mecca for Daily Throngs

TORONTO, Ont., Sept. 6.—The Annual Motor Exhibit in connection with the Canadian National Exposition, now running for two weeks in this city, is attracting equal if not greater interest than formerly, and the special building in which 34 distributors are exhibiting 48 different makes of cars is filled from morning until night with visitors. No separate admission is charged for the motor exhibit, the building being open to the general public within the grounds, the same as all other exhibit buildings.

The exhibit of the 48 different makes is one of the most complete seen at this exhibition, and represents all the large manufacturers in Canada and the United States. Only one European car is exhibited, the Vauxhall. There is an unusual number of stripped chassis as compared with former years and those firms including such in their exhibit are being well repaid as they are invariably great centers of interest. Working units, such as transmissions and engines, also attract attention.

While the passenger car portion of the show is housed in a separate building, which is completely filled, the exhibit of motor trucks and accessories is in another building in a remote portion of the grounds. Eighteen different makes of trucks are on exhibit, and there are 120 different accessory booths.

The Toronto Automobile Dealers Association, with its membership of 19 firms, represents a big portion of the industry, and the exhibit space of 35,000 sq. ft. is not adequate.

A. Sharp, general manager of the motor exhibit, and also general manager of the British-American Motors, hopes that in the next few years a special building will be erected that will adequately house the complete motor exhibit. It is planned to erect a two-level building, with the upper level for passenger cars, and the lower level for trucks, at a cost of approximately \$1,000,000.

Velie Works Day and Night; To Increase Dealers 25 Percent

MOLINE, Ill., Sept. 8.—Production of the new line of Velie motor cars is being held up by a lack of materials, although the present employment shift is working day and night to keep up the present rate. The company is many cars behind orders with production.

An increase of approximately 25 per cent in Velie dealers is expected within the next 60 days, said a factory executive. Many new dealers have signed contracts with the Velie corporation within the last few weeks.

Dealer Stocks Should Be Held to Safe Limits, Say Factories

Assert Operating Capital Largely Basis for Determining Number of Cars to Be Carried

DETROIT, Sept. 1.—Any stocking of dealers beyond the requirements of their immediate markets can be controlled and should be kept within reasonable limits, according to expressions by factory executives. Aside from a reasonable stocking for spring trade, dealers should not be expected to carry more cars than they can turn over with profit within a given time, executives say, and it is asserted, no contrary factory policy can long be enforced.

The setting up of any specific percentage of a year's allotment as a maximum stock at any time, is regarded, however, as a very difficult procedure to enforce owing to changeable conditions of the market, and the entirely different conditions surrounding each dealer's establishment.

Regardless of what a dealer's allotment for the year is, it is advanced, his operating capital is largely the determining point of what stock he shall carry.

The factory sales manager should know conditions in every territory, say officials, and should make all shipments to dealers entirely on what he knows the dealer can sell there. A thirty days' supply of cars is not unreasonable in any case, and a forty-five days' supply not excessive where a dealer has any capital or standing, assert officials, but aside from during the months of December, January and February, dealer stocks should never exceed this supply. Stocking during the winter is sound business, despite the experience of the present year in the belief of executives.

To Let Stocks Drop

To compensate somewhat for the carrying of stocks during the winter months, some of the factories will reduce their dealer stock requirements during the months from July to November. In this period stocks will be permitted to drop to almost as low points as dealers desire, as long, however, as they have enough cars to meet requirements of their market over a reasonable period. This would split up the burden of carrying stocks during the winter and still keep dealers from any possibility of losing sales through inability to get cars, as the factories working on good schedules would be in position to ship cars quickly.

Without stocking in the winter many sales would be lost in the spring owing to the inability of factories to get into high production rapidly after being on very low schedules. Though retail sales in winter are higher than formerly, they alone are not high enough to keep factory operation high.

What factory officials would appreciate much more, is an exact estimate by dealers of what they can sell, operating

High Powered Cars for Police Work

ST. LOUIS, Mo., Sept. 8.—The St. Louis Police Department has been provided with an especially constructed automobile which is capable of a speed of 80 miles an hour to enable policemen to cope with the activities of criminals who heretofore have been able easily to outdistance police by the use of high-powered cars.

The car is equipped with various devices to aid the police in the control of crime, and Phillip H. Brockman, president of the DeLuxe Automobile Co., Oldsmobile distributors in St. Louis, who is also president of the Board of Police Commissioners, said that the department would be furnished with nine more cars of the same type.

at full capacity of their sales force and facilities generally. If the factory estimates that more cars than this can be placed in this territory, additional representation should be sought, it is argued, instead of the dealer attempting to swing a greater business than his capitalization or his selling facilities will permit.

Mercer Car to Be Back in Production in Short Time

TRENTON, N. J., Sept. 4.—Mercer will be back on the market within a short time and will be displayed at the national shows, according to an announcement made following the incorporation of the Mercer Motor Car Co., which has taken over the plant of the old Mercer Motors Co.

Back of the new concern are William E. T. McDevitt and Frank Curran, who compose the firm of the Curran-McDevitt Motor Co. of Philadelphia, which sold Mercer cars for years. The Philadelphians some time back bought the uncumbered Mercer assets from the trustee and also took over the plant. Mr. McDevitt is one of the incorporators of the new company, along with J. L. Kuser, Jr., of Trenton, and C. De F. Besore.

It is the plan of the new owners to produce Mercer cars, with limited production and catering to the quality group of buyers. Final organization of the company will be completed soon, following which production plans will be taken up.

ORDER ILLINOIS PLATES

SPRINGFIELD, Ill., Sept. 8.—Dark brown plates lettered in white will be the Illinois motor license colors scheme for 1925 and contract for 1,165,000 plates has been let.

Wisconsin Retailers Find Situation Greatly Improved

August Decidedly Better Than July and Bright Outlook for Fall Is Reported

MILWAUKEE, Sept. 1.—With August sales having shown marked improvement over July, dealers and distributors of passenger cars in Wisconsin look forward to a splendid fall business volume. New models have taken very well in practically all cases, and coming simultaneously with better economic conditions, have proven a timely sales stimulus. The extent of the increase in business is shown in the extreme instance of one distributor whose sales during August ran more than 400 per cent ahead of July, the new model having made its appearance early in the last month.

While the greatest improvement has been shown by those dealers who have been holding their own throughout the period of depression, there has also been a pick-up noted among those who suffered most painfully from the lack of sales during the early summer months. The present outlook gives promise of a new lease of life for many smaller dealers and indicates a period of real prosperity to the leaders in the local field.

In general those dealers who have new models to handle this fall have been very fortunate in disposing of their old series cars. One distributor, who prior to the advent of the new models suffered from a tremendous overstock, has succeeded in disposing of practically all the old series cars, as well as selling the new models as rapidly as received from the factory. Other dealers report increases that average about 30 per cent over July, for August. Even with this increase, however, most of the dealers are still running somewhat behind last year.

The strongest hope for fall business lies in the improved condition of the Wisconsin farmer, who is marketing his crops at very profitable prices.

A. E. A. Receives Unexpected Flood of Show Space Requests

CHICAGO, Sept. 8.—If the demand for space at the November show of the Automotive Equipment Association, which is to be held in connection with the association's convention, maintains the present gait A. E. A. officials say there is doubt as to whether all exhibitors can be cared for on the main floors of the Chicago Coliseum and new annex. It was previously announced that prospects pointed to the ability of the management to house all displays on the main floors without having to make use of the balcony but since that time record receipts of contracts for space have changed the perspective. In view of the doubt A. E. E. officials urge all who want show space to act at once in order to avoid the possibility of disappointment.

"Progressive Exposition" Held by Milwaukee Trade a Success

Disagreement With Fair Management Turned Into Profitable Account When Dealers "Go Alone"

MILWAUKEE, Sept. 8.—Members of the Milwaukee Automotive Dealers' Association, undismayed by the turn of events which made it necessary to call off the tenth annual fall show in conjunction with the Wisconsin State Fair, Aug. 25-30, conducted a "progressive exposition" in its place, and early reports are that the results were far better than had been estimated.

Each member of the association decorated his sales building and staged a private show, which was linked with that of every other member by special advertising, invitations, etc. While the total number of guests probably fell below the usual aggregate attendance at the State Fair motor show, it is a fact that the quality of the visitors was many times better from a sales standpoint. State Fair crowds embraced many of the curious, while the very nature of the progressive exposition, as the private shows were called, attracted only those who have a real desire to see what the makers have to offer for the coming year and a deep-rooted desire to buy.

Trade Co-operates

Each dealer placed cars at the disposal of his guests who might be desirous of visiting the private show at other points in the city, and the member of the association worked together as true co-operators rather than merely as friendly competitors.

As already reported, the M. A. D. A. called off the Fair show when the fair management asked rentals amounting to about \$40,000 for show space, when for the past nine years the association has had the use of one large building for \$4,000 rental. In addition, the fair board denied use of this building and insisted that the dealers group their exhibits in a new Manufacturers' building, which would have been shared by exhibitors in other lines and thus destroyed the automobile show atmosphere and aspect of former years.

Gardner's Quick Assets About 40 Times Total Liabilities

ST. LOUIS, Mo.—In a financial statement issued by the Gardner Motor Co., Inc., as of August 1, the company shows a substantial cash balance on hand, no commercial debts or bank loans, and quick assets approximately 40 times total liabilities.

Russell E. Gardner, Jr., president of the company, said the company is operating on its own capital, paying cash for all parts and materials and producing cars in a sufficient volume to gain all the advantages of quantity buying and quantity production.

The company is behind in orders and a considerable amount of July business had to be carried over into August.

Whitewash Used to Promote Safety

COLUMBUS, O., Sept. 8.—L. A. Boulay, State Highway Director, has issued orders that all concrete culverts and small concrete bridges shall be whitewashed as a means of preventing automobile accidents.

During a recent road inspection, he said, it was observed that such whitewashed bridges and culverts stand out at night and protect the motorist against accidents.

Moon Motor Car Company Gives Out New Price Listings

ST. LOUIS, Sept. 8.—Following the recent announcement of price advances ranging from \$50 to \$100, the Moon Motor Car Co. made public the new prices of the 1925 models of Moon cars. All four chassis are now equipped with hydraulic four wheel brakes, genuine balloon tires and steel disk wheels as standard equipment without extra cost.

The price schedule of the 1925 line is given below:

Series "A"	
Four-passenger Roadster	\$1,450
Five-passenger Touring	1,395
Five-passenger Sedan, two door.....	1,695
Five-passenger Sedan, four door.....	1,795

"Newport"	
Five-passenger Touring	1,595
Four-passenger Coupe	2,035
Five-passenger Sedan	2,045
Five-passenger Petite Sedan*	2,245

"Metropolitan"	
Five-passenger Touring	1,695
Five-passenger Sedan	2,135
Five-passenger Petite Sedan*	2,245

"London"	
Five-passenger Touring	2,095
Seven-passenger Petite Sedan*	2,885

*Note—All Petite Sedans of various models carry six wheels, trunk rack and body rails as standard equipment.

RECORD BUS DRIVEAWAY

DETROIT, Sept. 8.—A factory record for size of bus driveaways was set by Reo Motor Car Co., recently when 11 Reo model W busses started for Chicago in one long line. Eight of the busses were of the sedan type similar to the one which has just completed the first transcontinental bus tour. Two continued from Chicago on to Denver, one took the road north to Duluth while another made its way southwest to St. Louis. Chicago, Minneapolis, Milwaukee, Peoria and Decatur, Ill., took the remaining units.

TAKE HUDSON-ESSEX AGENCY

DES MOINES, Sept. 8.—Ziegmann & Company, Odebolt, Iowa, have taken the agency for Hudson and Essex cars.

Andre Citroen's Company Has Adopted Joint Stock Scheme

Flat Rate System Used by Factory Organization Said to Have Proved Highly Successful

PARIS, Aug. 24.—(By mail.) Capitalized at 50,000,000 francs, the Citroen Automobile Company has just been changed into a joint stock company under the title Societe Anonyme Andre Citroen, with registered offices at 143 Quai de Javel, Paris. The capital is represented by 100,000 shares of 500 francs each, of which 30,000 are A shares, each one giving a right to ten votes at the company's meetings, and 70,000 are B shares, giving a right to one vote each. Andre Citroen holds all the A shares and 30,000 B shares.

Citroen's output is now averaging 300 cars a day, which is the highest ever attained by any European automobile factory. This represents two models: a 5 h.p. two-seater and a 10 h.p. in a variety of body styles. A six-passenger car having a four cylinder engine of 3.1 by 5.5 ins. bore and stroke, and fitted with mechanical four wheel brakes has been prepared and is ready for production. The general automobile industry is much interested to know whether this car will be brought out at the forthcoming shows, but this is a secret which Citroen has kept so closely guarded that even the business department claims it is in the dark.

Excellent Flat Rate Results

After one year's operation, excellent results are being obtained from the flat rate system which Citroen has made a part of his factory organization. This repair department is now handling up to 80 cars a day, and is so well organized that the average time a car remains in the shops does not exceed 24 hours. Even in the case of a complete wreck, no car is ever held in the repair shops more than one week. The method of operating is as follows. On the client presenting a car, it is immediately driven by an expert who diagnoses its condition and gives a price for the repairs from the flat rate catalog. A delivery date is fixed, and no cars are handed over to clients until they have been washed and polished. Cash payments are demanded for all repair work. When cars are shipped in the same procedure is followed, except that the price is mailed to the client before work is begun. The method of work is to change complete units even when comparatively minor repairs have to be carried out.

ALVORD ESTATE \$4,074,620

NEW YORK, Sept. 8.—An estate appraised at \$4,074,620 was left by the late John F. Alvord, president of the Splitdorf Electric Co. and former president of the Wire Wheel Corp. of America, his heir being his brother, George B. Alvord. His chief stock holding was in the Torrington Co., of which he was president, his 20,000 shares of stock in that concern being valued at \$800,000.

August Output 2 Per Cent Over July N. A. C. C. Estimates

**Totals Set at Rest Any Chance That
Last Year's Record Will Be
Reached**

NEW YORK, Sept. 8.—August production of cars and trucks increased 2 per cent over July, according to estimates made by the National Automobile Chamber of Commerce, based on shipping returns. The count is given at 268,477 as compared with 262,876 in July and is in keeping with the weekly report during August which told of even production, without any marked increases. Undoubtedly the fact there were no holidays last month is responsible for the slight gain.

With August's 268,477, the total for the eight months this year is 2,529,577 which is 184,910 below the same period in 1923, which returned 2,714,427. This would seem to set at rest any possibility of last year's record breaking output being reached by the industry. It also shows that conservatism rules among the makers who are not trying to see how many cars they can turn out but who are making every effort to meet the immediate needs of their distributors and dealers. There seems to be no signs of overproduction and recent increases undoubtedly have been brought about by the introduction of new models.

It is estimated that no one will attempt anything like capacity production this month, although it is thought that in another month or so there will be some factories which will take advantage of approaching winter and the consequent slowing of retail sales to put on enough steam to accumulate sufficient cars to meet spring's demand. It goes without saying, however, that there will not be the overproduction of last winter and whatever stocks are warehoused will be only what conservative opinion as to next year's early needs will justify.

Hoover Steel Ball Company Takes Over Imperial Bearing

DETROIT, Sept. 8.—The plant and equipment of the Imperial Bearing Co. of this city has been bought by the Hoover Steel Ball Co. of Ann Arbor for a price said to be in excess of half a million. The Imperial plant will be entirely discontinued, all equipment being removed to Ann Arbor, in which city the Hoover Company will supplement its former exclusive ball bearing product with a complete bearing line.

H. D. Runciman, general manager of the Hoover Company, confirming the purchase, said the acquisition of Imperial will give the Hoover Company an established complete line of bearings. The Imperial Company was owned by F. Earl Long and manufactured thrust and annular bearings. S. A. Strickland, who has been manager of the Imperial Company, will become manager of the bearing department of the Hoover Company.

N. A. C. C. Production Comparisons

The following table gives the N. A. C. C. production statistics for the months of 1923 and 1924:

	Output	
	1924	1923
January	316,278	243,554
February	367,527	276,955
March	382,474	355,073
April	373,203	382,746
May	312,865	394,190
June	245,817	378,575
July	262,876	328,063
August	268,477	345,271

Output for the other months of 1923 and 1922 follow:

	Output	
	1923	1922
September	327,506	297,206
October	365,162	239,406
November	312,996	237,329
December	303,201	228,410

Motor vehicle production segregated as to cars and trucks is as follows:

	Output	
	1923	1922
	Cars	Trucks
January	223,822	19,732
February	254,782	22,173
March	319,789	35,284
April	344,661	38,085
May	350,400	43,730
June	337,442	41,173
July	297,413	30,692
August	314,431	30,872
September	298,964	28,578
October	335,041	30,139
November	284,939	28,073
December	275,472	27,762

	Output	
	1924	1923
	Cars	Trucks
January	287,353	28,925
February	336,371	31,156
March	348,356	34,118
April	337,045	35,158
May	279,453	33,412
June	217,043	27,874
July	237,652	25,224
*August	242,477	26,000

*Estimated.

TO HANDLE BUICK

KEWANEE, Ill., Sept. 8.—J. O. Hoffman, who owns a garage on South Tenny street, has taken over the Buick agency from the Kewanee Buick Co. on North Chestnut street. The Kewanee-Buick will retain its staff and continue supply of Buick parts and service but Coppitz & Kirby, owners, have taken the Studebaker agency, leaving the Buick sale to Mr. Hoffman.

Best Demand of Two Years Is Expected by Cadillac Co.

**Convention of Distributors and Factory Representatives in Detroit
Marks V-type Car's Tenth Year**

DETROIT, Sept. 8.—Heavier demand for Cadillac cars will develop in the next two months, than at any time during the past two years, declared Lynn McNaughton, vice-president and general sales manager, at the convention of distributors and factory representatives just closed. The convention marked the completion of ten years production of the V-type, eight cylinder Cadillac car.

The convention was attended by practically all distributors or representatives from every part of the United States and Canada. Practically all of the distributors at the convention have been with the company since the first V-eights were introduced and many had records of fifteen to twenty years service.

H. H. Rice, president of the company, outlined plans and market possibilities, during the coming year. His address was one of the high spots of the convention, and his statement that large buying of automobiles would soon be resumed was received with enthusiasm. Ernest W. Seaholm, chief engineer, explained in detail the process of constant improvement which is being made in the car.

De Palma Wins Three of Six Events at San Jose, Cal., Races

SAN JOSE, Cal., Sept. 8.—Ralph De Palma drove to victory in three of the six events of the Labor Day dirt track races held here by the Western Racing Association. He also won the W. R. A. silver trophy for the fastest single lap, 28 3/5 seconds. Fifteen thousand passed through the turnstiles.

Adolph Gusti was seriously injured when his car threw a front wheel and Harold Pimloct slightly hurt when he lost control and crashed through the fence.

"Repair" Wins in St. Louis Referendum Over Use of Word "Service"

ST. LOUIS, Mo., Sept. 6.—As a result of a referendum vote recently taken by Robert E. Lee, manager of the St. Louis Automobile Dealers' Association on the question of calling "Repair Departments" of automobile firms, repair departments or service departments, the vote has been so nearly unanimous F. C. McDonald, president of the Association, announced that the change to Repair Department, so far as members of the Association are concerned, had been made effective September 1.

There had been dissatisfaction over the name "Service Department," as dealers felt that it conveyed to the public that work done there was not to be charged for. The name Repair Department, they say, will give the proper impression that work done on a machine by the department should be and must be paid for, just as is the case with the repair departments of jewelry houses or electrical concerns, or any other kind of a firm where maintenance is required.

U. S. Farmer's Financial Position at Highest Point of 47-Month Period

WASHINGTON, Sept. 8.—The financial position of the American farmer, one of the largest potential group purchasers of automobiles and trucks, is at its highest point at any time during the past 47 months. This is shown in a survey, as of September 1st, just completed by the U. S. Department of Agriculture.

The figures show that the combined exchange value of 16 leading farm products on August 1, was 83, as an index number, as compared with the 1913 base of 100, being "The highest point reached in 47 months," the department declares and adds:

"The financial position of farms as measured by the exchange value of their products for non-agricultural commodities including clothing, fuel, automobiles, metals, building materials and house furnishings is gradually working toward a pre-war parity."

Walker Vehicle Makes Revision of Weights; Prices Unchanged

CHICAGO, Sept. 8.—The Walker Vehicle Company, of Chicago, has announced a revision of weights for its line of electric commercial trucks, the changes affecting all but one unit. It was erroneously published elsewhere recently that the Walker Company had increased its list prices. No change in prices has been announced. The following table gives the old and new weights:

Tons			
Model	Capacity	Old Weight	New Weight
12.....	1½	1,900	1,900
15.....	¾	2,600	2,800
22.....	1	2,800	3,000
42.....	2	3,800	4,200
P.....	3	5,600	6,000
N.....	5	6,400	6,700

BIG LOSSES IN POOR PACKING

WASHINGTON, Sept. 8.—Investigations are being undertaken by the recently organized Domestic Commerce Division of the Department of Commerce at the request of automobile and other manufacturers who are anxious to cut down the present enormous losses due to poor packing, Director Klein announces. He says the new domestic studies are a direct result of the investigations into export packing carried on by his bureau some months ago at the suggestion of the House Committee on Merchant Marine and Fisheries.

According to Dr. Klein, losses to railroads alone during 1922 because of improper packing are estimated at \$11,800,000.

HEAD OF SALES

JAMESTOWN, N. Y., Sept. 8.—Joseph P. Meli, salesman for the Anderson Motor Sales Co., of Jamestown, N. Y., has been made sales manager for the company, with complete charge of sales of Velie and Marmon cars throughout the Jamestown territory.

DEFER BATTERY MEN'S MEETING

CHICAGO, Sept. 3.—The fall meeting of the National Battery Manufacturers' Association scheduled for Sept. 19-20 has been postponed one week. It will be held Sept. 26 and 27 at Hotel Clifton, Niagara Falls, on the Canadian side. Matters of vital importance to the entire automotive industry will come up for discussion at this time, among these being the question of charging for service and the part the association will play in getting behind this movement. Business ethics, the matter of guarantees and further consideration of a commissioner to actively handle the business of the association will also come before the convention.

TO FIGHT CITY'S RULING

CINCINNATI, Ohio, Sept. 8.—Automobile dealers who sell new or used cars on the dollar down, dollar a week plan, announced that they would seek a higher court decision when Judge Yeatman of the Municipal Court decided that if city authorities removed an automobile from the street, the city's claim for towing and storage has to be paid before the mortgage on the car.

"When the city removes an automobile from the streets, it thereby raises a case against the owner of the car, and the city's bill for towing and storage becomes a part of the court costs in that case against the owner," Judge Yeatman said.

The attorneys said that the question is of importance because of the new ordinance that would permit the police to order a car towed and stored at the owner's expense, whenever there is any violation of a traffic ordinance, instead of citing the owner to appear in Police court, as at present.

GETS RAMSEY AGENCY

ST. LOUIS, Sept. 6.—The Morse Engineering Co. has been appointed exclusive territorial selling agent for the Ramsey Chain Co. of Albany, N. Y.

Paige-Jewett Stocks of New Cars With Dealers Very Low

Retailers During July Reported to Have Sold 2,400 More Units Than Factory Shipped

DETROIT, Sept. 8.—Stock records of new cars in the hands of Paige and Jewett dealers show an average of two and one-half Jewett and three-quarter Paige cars per dealer, according to a statement by H. M. Jewett, president of the Paige-Detroit Motor Car Co. This average includes cars on showroom floor and demonstrators, both of which usually are not included in records of this kind.

A full line of models in each dealer's hands would include seven Jewetts and seven Paiges.

Mr. Jewett said further:

"The Paige-Detroit Motor Car Co. has no cars in storage, having only the normal day to day supply to meet shipping requirements. During the month of July stocks in dealers' hands were decreased 2,400 new cars, 300 of which were Paige and 2,100 Jewett.

"This means that Paige and Jewett dealers sold during the month 2,400 more new cars than were shipped from the factory. The present stock of cars per dealer is as low as the company has ever had under normal circumstances.

"Our records, obtained from dealer reports, also show less capital tied up in used cars than at the same period last year. There is every indication that the automobile industry and the Paige-Detroit Motor Car Co. will enjoy a larger volume of business this fall than during the same period of any other year."

New Zealand Holds Steady As U. S. Car and Truck Mart

WASHINGTON, Sept. 8.—New Zealand is maintaining its position as one of the leading markets for cars and trucks made in the United States, it is announced here by the Automotive Division of the Commerce Department following compilation of statistics for the first six months of this year. It is found that New Zealand has varied but slightly from the rate set last year.

During the first half of this year, New Zealand has held 12th place among the passenger car markets of the United States, and 14th place among truck markets as compared with 11th and 14th, respectively, during the year 1923. Shipments to New Zealand so far this year have been only slightly less than half of those during the 12 months of last year, showing that in general the automotive trade with that country is well sustained. The latter half of 1924, if consistent with past years, will see the usual spring boom, since seasons are reversed in this land south of the equator.

Dario Resta Meets Death in Brooklands Speedway Trials

Tragedy Closely Follows Boyer's Fatal Accident; Both Drivers Had Won Indianapolis Classics

NEW YORK, Sept. 6.—Dario Resta, internationally famous as a race driver, was killed on Brooklands Speedway Sept. 3, according to cable advices from London. Resta, driving a Sunbeam, was engaged in record trials when his car overturned, caught fire and the pilot was fatally injured.

Following so closely the Labor Day accident on the Altoona speedway in this country in which Joe Boyer met his death, followers of motor sport were greatly shocked by two fatalities in 48 hours, each of which claimed as its victim a man who had won the annual 500 mile race at Indianapolis. Resta won in 1916 and Boyer captured the honors this year through piloting Comer's Duesenberg to victory after his own car had gone to the pits. Of the other six to achieve fame in the Hoosier classic Gaston Chevrolet and Howdy Wilcox met fates similar to Resta's and Boyer's, leaving as survivors Ray Harroun, Joe Dawson, Jules Goux, Rene Thomas, Ralph De Palma, Tommy Milton and Jimmy Murphy.

To America in 1915

Resta came to America in 1915 after having made a name for himself as a race driver in England and France. His first appearance on this side was at the Panama-Pacific Exposition at San Francisco, where he gained instant fame by winning both the Vanderbilt Cup and the American Grand Prix, piloting Peugeot. He followed this up with a most successful speedway campaign which included finishing second to De Palma in the Indianapolis race of that year, a speed battle that has gone down into history because of the thrilling fight between Resta and De Palma, the latter winning with a slower car through his superior driving. Resta went the rest of the season in brilliant style, winning not only the opening event on the new Chicago speedway, a 500 mile race, but also capturing two special invitation 100 mile races in which he defeated all the top-notchers, including De Palma, Rickenbacker, Burman, Mulford, Cooper, Oldfield and Aitken.

Captured A. A. A. Title

Even greater honors came the following year, 1916, when Resta not only won the 500 mile sweepstakes at Indianapolis, but went through the season with such great success that at the end he had captured the title of champion driver, awarded by the American Automobile Association for the first time.

Soon after this Resta quit the racing path to become representative of the English Sunbeam in this country, with headquarters in New York. The lure of racing was too strong for him, however, and last fall he returned to England again to join the Sunbeam racing team.

Ford Motor Company's Balance Sheet for 1923 Shows \$100,000,000 Surplus Increase

LANSING, Mich., Sept. 8.—Complying with the requirements of Michigan laws, the Ford Motor Co. has filed with the Secretary of State at Lansing its balance sheet for the year ended Dec. 31, 1923. This shows a surplus of \$442,041,081, an increase of approximately \$100,000,000 over 1922. Of this net gain of \$99,242,888, all but \$27,911,923 was made in the first half. Production for the year totaled 1,833,812 units.

Assets and liabilities total \$637,396,834 as compared with \$597,339,236 in June, 1923 and \$504,802,900 on Dec. 31, 1922.

The balance sheets of 1923 and 1922 compare as follows:

ASSETS		
	Dec. 31, 1923	Dec. 31, 1922
Real Estate, equipment, etc.	\$250,084,685	\$186,515,333
Cash and receivables	251,173,583	232,674,302
Securities	40,963,073	18,487,994
Modse. and supplies	94,328,306	66,565,725
Prepaid expenses	847,187	559,546
Total	\$637,396,834	\$504,802,900
LIABILITIES		
	Dec. 31, 1923	Dec. 31, 1922
Accounts payable	\$ 51,002,155	\$ 30,554,657
Employees' investments	20,357,782	14,403,721
Accrued exp. and tax	37,253,093	40,179,563
Reserve for depreciation	69,295,195	59,451,336
Amortization patents	183,028	150,930
Capital stock	17,264,500	17,264,500
Surplus	442,041,081	342,798,193
Total	\$637,396,834	\$504,802,900

GET LOCKHEED CONTRACT

DETROIT, Sept. 3.—Special service arrangements have been made by the Hydraulic Brake Co., whereby the regular service afforded by dealers handling Lockheed brake equipped cars will be supplemented by a national service through the Wagner Electric Corp. stations in all principal cities. This special service is similar to the special service on electric equipment provided through the electric stations of the country.

In addition to its manufacture of replacement parts for the Lockheed equipment, the Wagner company will manufacture brake installations for car manufacturing companies which are licensed by the Hydraulic company. It is pointed out by the Lockheed company in this connection that a car manufacturer licensed to use the Lockheed equipment may have this equipment manufactured wherever he desires or may make it himself. The Lockheed company only furnishes the engineering specifications necessary.

HANDLES FORD AND LINCOLN

TOLEDO, Sept. 8.—The J. F. Bowman Co., has taken a 10-year lease on the Dennis building at 2111-2119 Adams street and will succeed the H. H. Dennis Co., as an agency for sale of Ford cars and tractors and Lincoln cars at Toledo. Mr. Bowman has been for five years vice-president in charge of sales at the Garford Motor Truck Co., Lima.

Treble Present Bus Service in Prospect for New York

NEW YORK, Sept. 6.—Operation of approximately 900 buses on the streets of Greater New York as against 300 now, by the Fifth Avenue Coach Co. will follow if the Board of Estimate grants the application of this subsidiary of the Omnibus Corp. of America, for long time franchises giving it 116 miles of additional lines in Manhattan, the Bronx and Queens. It is proposed to install 34 new routes, which necessarily will bring the Fifth Avenue Coach Co. into active competition with the Interborough Rapid Transit Co., operating subways and elevated lines.

This move is the first step taken by John Hertz, head of the Omnibus corporation, to carry out the aims of his big organization, which seeks to install model motor transportation service in the larger cities of the United States. Favorable action is anticipated as it is regarded as offering much needed transit relief to New York. Provision is made for the city to receive 2 per cent of the gross earnings and the lines will be re-capturable and then can be operated by the municipality.

IN NEW HOME

MINNEAPOLIS, Sept. 8.—The St. Anthony Motor Car Co., Minneapolis community Chevrolet agent, has moved to a new \$25,000 building at 420 Central Avenue, 90 feet front. W. H. Crossland is president.

"Better Business" Big Words at M. A. M. A. Fall Convention

Interesting Sessions of Organization
Will Be Held Oct. 15-17 in
Cleveland, Ohio

NEW YORK, Sept. 5.—"Getting Ready for Better Business" will be the keynote of the fall convention of the Motor and Accessory Manufacturers' Association, which will be held at the Hollenden hotel in Cleveland Oct. 15-17.

This was decided upon at the first meeting of the convention committee held here yesterday and presided over by Chairman E. P. Chalfant of the Gill Manufacturing Co. At the same time the personnel of the committee was announced, it being made up of M. H. Tsine, A. Schrader's Son; J. F. Kelly, Electric Storage Battery Co.; A. H. Grayburn, Norma-Hoffmann Bearing Corp.; B. M. Asch, Asch & Co.; J. Lorentz, Laidlaw Co., and Frank White, Stewart-Warner Speedometer Corp.

The first day's session of the convention will be devoted to the business outlook, with a prominent international financial authority as one of the main speakers. In addition there will be a summary of the automotive outlook by presidents of several of the leading automotive associations.

Merchandising will be the theme the second day, with discussions on the jobber, specialty distributors and dealers, while foreign trade also will be on the car prominently. On the third day there will be a credit session on manufacturers' credit as well as jobbers and dealers.

TAKES OVER INDIANA COMPANY

DETROIT, Sept. 6.—The Kendell Co. of America, which has taken over the Kendell Motor Products Co., of Fort Wayne, Ind., has moved all equipment and material to this city, where it will continue the manufacture of the Kendell piston ring. The production schedule calling for 14,000 rings daily.

A sales organization is now in effect in Indiana, Kentucky, West Virginia, Virginia, District of Columbia, North Carolina, Arizona, New York and Tennessee, each state having one or more associate or affiliated companies to handle the distribution. In addition to this the sales force will be increased to 150 men to handle the rest of the national business, and an export office will be established in New York City.

45 PER CENT INCREASE

NEW YORK, Sept. 8.—A 45 per cent increase during a depression period was reported by the Apco Manufacturing Co., whose statement for the first half of this year shows \$548,182 sales, against \$376,381 in the same period of last year. With a big battery charger business in sight for September, the company predicts a total of \$1,750,000 for the full year.

Motor Figured in One Out of Four Accidents of All Kinds for United States During 1922

Automobile Fatalities Represented From Third to Fifth of Tragic
Mishaps in Five Cities, With Rate Also High in Others

WASHINGTON, Sept. 6.—Deaths from automobile accidents were far greater than those from railroad or street car accidents in 67 cities of 100,000 population or more, according to a report made public by the U. S. Census Bureau to the Committee on Statistics of the Conference on Street and Highway Safety.

More than one in every four fatal accidents was due to the automobile, the complete figures for 1922 show; while in the case of five cities the deaths from automobiles represented about one-third to one-fifth of the deaths from all accidents in these cities. In Los Angeles the death rate from automobiles was 29.5 per 100,000 of population, this being the highest. The other four cities and their rates were: Camden, with a rate of 27.9; Memphis, whose rate was 25; Atlanta, which had a rate of 24.7, and Paterson, with a rate of 24.5.

Ten other of the 67 cities had death

rates above 20 per 100,000 from automobiles, while only three had rates below ten. Houston's rate from automobile accidents was paralleled by her rate from railroad accidents, the rate in each case being 18 per 100,000 population. Jersey City was another notable exception to the average experience, having a higher death rate from railroad than automobile accidents.

For the registration area, which includes 85 per cent of the population of the United States, a comparison of the death rates from railroads, street cars and automobiles, shows a rate from automobiles more than twice that from railroads and nearly eight times that from street cars.

In the cities of the registration states, the rate from automobiles was 16.9 per 100,000 population, or more than twice as high as the rate in rural districts, the report shows.

Large Crowd Attends Annual Outing of Toledo Association

TOLEDO, Sept. 8.—More than 150 automobile, tire and accessory dealers attended the annual outing and frolic of the Toledo Automotive Trades association at Cedar Point.

The big crowd went to the Point on the Str. Frank E. Kirby, having luncheon on the boat and dinner on the return trip.

At Cedar Point the automobile men made merry at everything from bathing to airplane cruising.

The Indoor Sports committee in charge of George Close, had arranged a good program. George Kopf was general chairman and Thomas Cooper, secretary of the association, took care of the details.

ADDS CHEVROLET

ATLANTA, Ga., Sept. 6.—Appointment of John E. Smith, one of the pioneer dealers of Atlanta, as distributor of the Chevrolet line in the Atlanta territory, has been announced by the Atlanta branch. Mr. Smith will handle the Chevrolet in connection with the Reo, for which he is Georgia distributor. He is the oldest automobile dealer in Atlanta.

MORRIS PRICES REDUCED

LONDON, Sept. 8.—(By cable).—Prices of Morris cars have been reduced 12 per cent, it is announced.

CHANGE DISTRIBUTING PLAN

DETROIT, Sept. 8.—Under changed distribution plans for Delco electrical equipment for Fords, United Motors Service is awarding territorial rights based upon a fixed rate of business. The plan provides for the placing of the Ford equipment with distributors in all important cities of the country, who will sell it on both a retail and wholesale bases.

In allotting territory, United Motors Service will agree with the distributor on the amount of business that can safely be expected at the outset, and will keep quotas low to insure a steady flow of business. The company will not seek exclusive representation but will insist upon definite merchandising effort in meeting the needs of territories.

During the period of its introduction, the schedule of production of Delco Ford equipment is on a basis of 5,000 units annually.

BUICK AGENTS TO BUILD

SAN ANTONIO, Tex., Sept. 8.—The San Antonio Buick Co., 446 Main Ave., San Antonio, Tex., Buick distributor, plans construction this year of a two story building to be used as sales rooms and service station.

SUCCEEDS GROTH CO.

DES MOINES, Sept. 8.—The Mohr Battery Co., Remsen, Iowa, is successor to the Groth Motor Company.

October May See Launching of Bus Owners Association

Many Interesting Features Planned
for Motor Transportation Show
Oct. 21-27 in Chicago

DETROIT, Sept. 6.—To provide facilities for meetings during the national motor transportation show of Motor Truck Industries, Inc., the association will set aside a convention hall in the show building where dealers, or operators of trucks and buses, may meet for discussions. It is the belief of the truck association that plans relative to the formation of a national bus owners association will come to a head about the time of the transportation show and the convention hall will be available for meetings incidental to this. The show will be held Oct. 21 to 27 in American Exposition Palace, Chicago.

Motor Truck Industries will soon issue invitations to the show, these to be limited to dealers and national owners of trucks and buses. These invitations will offer the use of facilities of American Exposition Palace as headquarters for various get-together meetings which the dealers or truck or bus owners may schedule for show week.

Passenger and freight transportation alike will be features of the show. The actual exhibiting of the trucks on the exhibition floor will be an incidental to the working demonstration of the vehicles and special equipment in a space adjoining the exposition building. Every innovation in truck design or adaptation of equipment to truck use will be shown working.

Nationally known figures in the industry, not only in the manufacturing end but in the transportation field as well, will attend the show and will address special meetings. Legislative questions and suggestions on how to advance the cause of commercial vehicles will be leading matters of discussion. Space in the show has been contracted for on an extensive scale.

COMPARE SALES STATISTICS

PHILADELPHIA, Sept. 8.—Members of the Philadelphia Automobile Trade Association recently were much puzzled over authentic figures showing that for the months of March, April, May, June and July, Cleveland, O., having one-third the population of Philadelphia, sold 2,248 more new cars than were disposed of in the same time by dealers in the Quaker City. The totals for the five-month period were, Cleveland, 18,424 cars and Philadelphia, only 16,176. Close analysis, however, showed that the difference lay entirely in the greater number of low-priced automobiles sold in Cleveland, chiefly Fords, Chevrolets and Stars. In high and medium-priced cars, Philadelphia has been far and away ahead in the five months' sales.

Plan Enlargement of Automotive School

FOND DU LAC, Wis., Sept. 8.—To take advantage of the opportunity afforded by the interest of local young men in learning the care, repair and maintenance of motor vehicles, the Fond du Lac Vocational School Board has decided to effect a large increase in the area and equipment of the automotive mechanics' department of the machine shop section.

A space of 20x50 ft. is being taken from the machine shop proper and partitioned off with the automotive mechanics' area.

The equipment is being rearranged to accommodate some new tools and benches. According to requests for reservations for the coming year's course, this has now become the most popular department of the school.

275 Speakers Scheduled for Safety Congress in Louisville

CHICAGO, Sept. 6.—Plans made by the National Safety Council for its thirteenth annual safety congress, to be held in Louisville Sept. 29-Oct. 3, call for 275 speakers, including Secretary of Commerce Herbert Hoover and Secretary of Labor James J. Davis. Motoring interests will be represented by Ernest N. Smith, general manager of the American Automobile Association, and C. F. Kettering, president of the General Motors Research Corp.

Representatives of the American Automobile Association, National Automobile Chamber of Commerce and the International Chiefs of Police Association will be brought together in the public safety program. There will be a special street and highway exhibit, consisting of records and charts, signs and signals, etc., used in street traffic control and regulation and public safety work.

More than 4,000 industrial plants and Community Safety Councils in 60 American cities will be represented at Louisville.

MOTOR INQUIRIES LEAD

WASHINGTON, Sept. 6.—Of all commodities, pushed in foreign markets, by the agencies of the Federal government, automotive products ranks first, according to a tabulation of statistics recently completed by the U. S. Bureau of Foreign and Domestic Commerce.

The figures show that out of the 15 divisions, of which the automotive division is one, in the Bureau that approximately one out of every 11 inquiries handled by the Bureau relates in some way to the sale of automotive products abroad.

Predicts Greatest Highway Building in World History

Bowlby Says U. S. Project When
Completed Will Exceed All
Other National Systems

WASHINGTON, Sept. 8.—Prediction that the completion of the largest program of public works ever undertaken by any nation in the history of the world, in accordance with the terms of the Federal Highway act of November, 1921, will be effected within ten or twelve years was made here by Col. H. L. Bowlby, senior highway engineer, U. S. Bureau of Public Roads, in a radio address on "Uncle Sam as a Road Builder."

"This great work," said Col. Bowlby, "will be done by the Department of Agriculture through the Bureau of Public Roads and the various state highway departments acting in cooperation. On the basis of the most liberal appropriations which are likely to be made by the Congress, it is estimated that construction of the complete system will consume from ten to twelve years. The greater part of the field forces necessary to carry out this program of highway construction will be employed by the several state highway departments, but a considerable force will be required by the Federal government in carrying on its work of supervision and research.

Will Total 200,000 Miles

"The Federal Highway act provided that a system comprising 7 per cent of the total public road mileage of the country might be improved with the assistance of the Federal government. This system when completed will amount to approximately 200,000 miles of highway. To date approximately 170,000 miles have been approved by the Bureau of Public Roads and are now eligible to receive the benefits of Federal aid. Other nations of the world have systems of national highways. The total mileage of all other national highway systems does not exceed 150,000 miles. Our system of Federal aid highways approximates 200,000 miles so that in the United States our proposed system is nearly 33 per cent greater than all other national highway systems of the world combined.

"America has inaugurated the construction of the greatest system of improved highways ever dreamed of on this planet. Let us build them—not for a day but for all time."

FACTORY STAGES PARADE

WINNIPEG, Man., Sept. 8.—Willys-Overland Winnipeg factory branch recently staged a unique parade displaying all lines of cars handled by the branch. The parade was headed by trucks carrying a band and finished up with a truck containing the latest model "Blue Bird."

With the Associations

Association Adopts Creed

SAN DIEGO, Cal., Sept. 8.—The San Diego County Auto Trade Association has adopted the following creed to be displayed over the signatures of its members:

I hereby agree and pledge myself to uphold the constitution of the United States, the State of California and the municipality in which I live. I also agree to uphold and live up to the constitution and by-laws of the San Diego Auto Trades Association. I also agree to render the best service I can to the motorists at all times, making my charges just, for work performed and to treat the motorists and fellow member as I would like to be treated by them. I will not recommend any one for membership in the San Diego Auto Trades Association of California, whose business and moral integrity is not above reproach. Should I fail to live up to the standards above set forth, I would be a man without principle and without honor. I further agree and promise to abide by any decision the Association

may impose upon me should I wilfully and knowingly violate the above pledge.

Elected to Board

LOUISVILLE, Ky., Sept. 8.—Turner A. Summers was elected to the board of directors of the Louisville Automobile Dealers' Association at a special meeting of the board recently. He succeeds J. H. Limbird, who resigned after selling the business of the Overland Louisville Company, of which he was president.

Mr. Summers has been in the automobile business in Louisville about eight years. He formed a partnership with Roy E. Warner, Ford dealer, in 1916 and later became the principal owner of the business, which now operates as Summers-Herrmann, Inc., Ford dealers.

Governors on Cruise

SPRINGFIELD, Mass., Sept. 8.—Members of the board of governors of the Springfield Automotive Dealers' Association were guests of George E. Graham,

head of the Springfield Buick Co., on a cruise down the Connecticut River and on Long Island Sound on Mr. Graham's yacht, Grace B., recently. The party consisted of Charles R. Culver, Pierce Arrow; R. M. Sauers, Marmon and Hupmobile;; O. H. Hunting, Franklin and Rickenbacker; G. G. Byrnes, Ford and Lincoln; H. H. Bierman, Reo; John S. Harrington, Hudson and Essex; Harry W. Stacy, secretary of the association, and Mr. Graham.

Meeting Optimistic

WINNEPEG, Man., Sept. 8.—An optimistic tone pervaded the annual meeting of the Auto Top and Trimmers Association held recently. Past conditions of trade were reported as fair with a big improvement for the future forecast. J. Murray of J. Murray & Co. was elected chairman for the ensuing year and R. T. Gibbons re-elected secretary. Members of the executive committee elected were J. Blair, J. Devine, W. R. Jeanes, S. Pifer and O. E. Wood.

Coming Motor Events

Automobile Shows

Chicago	Jan. 24-31, 1925
National Automobile Chamber of Commerce.	
Chicago	Oct. 11-18
Second Annual Closed Car Show, Coliseum, under the auspices of the Chicago Automobile Trade Association. L. L. Fest in charge.	
Chicago	Oct. 21-27
First National Transportation Show in American Exposition Building, promoted by Motor Truck Industries, Inc. William Hallanger, Manager.	
Chicago	Jan. 26-31
Twentieth Annual Automobile Salon.	
Clarksburg, W. Va.	Oct. 16-18
Clarksburg Automotive Trade Association Closed Car Show, Carmichael Auditorium.	
Dallas, Texas	Oct. 11-26
Annual Automobile Show, Fair Grounds, under the auspices of the Dallas Automotive Trades Association.	
Detroit	Jan. 17-24, 1925
Detroit Automobile Show, Detroit Dealers' Association.	
El Paso, Texas	Sept. 20-27
Automobile Show, Exposition Grounds, under the auspices of the Automobile Department of the International Fair Association. W. J. Wile and E. C. Held, General Chairmen.	
Indianapolis	Sept. 1-6
Annual Fall Automobile and Accessory Show, in conjunction with Indiana State Fair, Automobile Building, Fair Grounds. William Jones, Manager.	
Kansas City, Mo.	Feb. 7-14, 1925
Kansas City Motor Car Dealers' Association Show.	

Newark, N. J.	Jan. 10-17, 1925
Eighteenth Annual Automobile Show under the auspices of the New Jersey Automobile Exhibition Co., Chamber of Commerce Building. Claude E. Holgate, Manager.	
New York	Nov. 9-15
Twentieth Annual Automobile Salon, Hotel Commodore.	
New York	Jan. 3-10, 1925
National Automobile Chamber of Commerce.	
Philadelphia	Jan. 10-17, 1925
Twenty-fourth Annual Automobile Show, Philadelphia Automobile Trade Association, Commercial Museum.	
Pittsburgh, Pa.	Jan. 31-Feb. 7, 1925
Twenty-ninth Annual Automobile Show, Motor Square Garden, under the auspices of the Automotive Association, Jno. J. Bell, Manager.	
Sacramento, Cal.	Sept. 1-10
State Agricultural Society. C. E. Paine, Manager.	
Toronto, Ont.	Aug. 23-Sept. 6
Canadian Automotive Equipment Association and the Automotive Industries of Canada. Gib Robertson, Secretary.	

Foreign Shows

Berlin	Sept. 26-Oct. 5
Paris, France	Oct. 2-12
Passenger Car and Accessory Show.	
London, England	Oct. 16-25

Conventions

Akron, Ohio	Nov. 18-20
Annual Convention of the National Tire Dealers Association.	
Atlantic City	Oct. 14-17
Thirteenth Annual Convention National Hardware Association of the United States, Marlborough-Blenheim Hotel.	

Chicago	Nov. 10-15
Annual convention and show, Automotive Equipment Association.	
Chicago	Jan. 26-29, 1925
Eighth Annual Convention, N. A. D. A., Hotel LaSalle.	
Cleveland, O.	Oct. 15-17
Fall convention Motor and Accessory Manufacturers' Association.	
Cleveland	Nov. 18-19
Joint Service Meeting of the Society of Automotive Engineers and the National Automobile Chamber of Commerce.	
Columbus, O.	Dec. 10-11
Ohio Automotive Trade Association's annual convention.	
Detroit	Oct. 22-24
S. A. E. Production Meeting and Exhibition.	
Detroit	January
Annual Meeting of the Society of Automotive Engineers.	
New York City	Jan. 7, 1925
New York Show, Convention N. A. D. A., Hotel Commodore.	
White Sulphur Springs, W. Va.	Sept. 17-20
Annual Meeting of the Automotive Electric Association, Greenbrier Hotel.	
Wilkes-Barre, Pa.	Oct. 17-18
Fourth Annual Convention of the Pennsylvania Automotive Association, Hotel Stirling.	

Races

Fresno, Cal.	Oct. 4
Fresno Speedway Association—150 miles.	
Kansas City, Mo.	Oct. 19
Kansas City Speedway Association—250 miles.	
Los Angeles, Cal.	Nov. 29
Los Angeles Speedway Association—250 miles.	
Milan, Italy	Sept. 7
Monza Track—Italian Grand Prix.	
Readville, Mass.	Sept. 6
Short races—Jack Le Cain, Promoter.	
Syracuse, N. Y.	Sept. 13
Horace P. Murphy—100 miles.	

SQUEEKS & RATTLES

ONE of this department's numerous undersecretaries fished the following out of the mountains of mail with which we are deluged daily.

Dear Squeeks: Will you please tell me what a "gyp" is? I have been given several definitions but they are all half of one per cent—entirely too weak for normal purposes. Kindly do your stuff, Squeeks, and you will win my deep appreciation.

Your truly,

"H. J."—Denver.

Wish "H. J." had signed his full name. Perhaps, this is our old friend, Heebie Jeebie, from whom we have not heard in some time. Anyhow, "H. J.," in re your favor of even date beg to state that we'd rather try to drive a railroad spike with a hunk of butter or file a steel part with a nutmeg grater. To be perfectly honest, words fail us in this tense emergency. Our advice, if a complete and properly phrased definition is desired, would be to refer the query to some of Gyp's victims. We know an old sailor who, no doubt, could give you the dope in seven languages and then apologize for giving you short measure. Hoping you are the same, that is—well, you know what we mean, "H. J.," we beg to remain,

Yours very truly, etc.

Absolutely Hopeless

*We'd picture what a "gyp" might be,
With brilliant gobs of paint,
But jumpin' crickets
In Old Nick's thickets,
Please picture what one ain't.
We know a few words apropos
For this descriptive spree,
Yet our best cussin'
Would be but mussin'
The opportunity.*

Legitimate taxicab drivers complain that two-price, grab-it-and-run outlaws in that field menace honest business. Those birds are not taxi drivers, however. They are taxidermists.

Distance Lends Enchantment

I. Skinnem: "What do you mean by fixing a tourist's car like that?"

Conscientious Employe: "It was only fixed to hold up five miles."

I. Skinnem: "That's the objection. Fixed for five miles and back he comes. Always give a tourist a 50-mile job."

The two gyps were cast upon a desert isle—and they would have starved had they not conceived the idea of opening a business establishment and taking turn about being the customer.

And remember

THIS—

A train

NEVER

Stalls at the crossing.

Somebody Lied

Uncle Otto had been in the big city and had seen all the sights. The night after his return he was down at the general store telling all about it. "One thing sure puzzled me, though," said the old man, "in one of the street cars I rode in they had a sign that said, 'Safest transportation in the world, five million persons carried last year without a fatal accident.' But what looked kinder suspicious was another sign over at one side that said, 'Do not delay, buy your cemetery lot now.' So I guess Mirandy an' me will stay home from now on."

Our Weekly Sermon

Have a clean shop if you want to keep from writing unnecessary upkeep checks. Remember, dirt collects.

Chronic divorcees at the marriage counter never think of digging up the old car to offer for a trade-in. Widows who call there don't seem to either, for that matter.

Newspaper reports say flying fish broke down telegraph wires at Ocean City, New Jersey. Flying fish could not have done it. Must have been some of Jersey's mosquitoes.

There was a fire at one of the rubber plants but how could you tell—with so many candidates' cigars in circulation?

"All Is Quiet in Herrin," spoofs a headline. What it means is "Riot."

Prices and Weights of Current Passenger Car Models

Ship.	Wt.	Pass.	Body Style	Price
AMERICAN "D-66"				
2985	2-p	Roadster		\$1,950
3175	4-p	Sp. Roadster		2,050
3260	5-p	Touring		1,695
3300	5-p	Sport		1,850
3310	7-p	Touring		1,760
3190	4-p	Sp. Touring		1,885
3470	7-p	Sedan		2,550
3310	5-p	Brougham		2,195
ANDERSON "41"				
2650	5-p	Touring		\$1,195
2675	4-p	Sp. Touring		1,445
2925	2-p	Coupe		1,425
2725	4-p	Coach		1,495
2875	5-p	Sedan		1,695
2925	5-p	Sp. Sedan		1,895
		Brougham 3 d.		1,595
		"50"		
2975	7-p	Touring		1,595
3200	7-p	Sedan		1,945
APPERSON "6"				
2915	5-p	Phaeton		\$1,395
2965	5-p	Sp. Phaeton		1,600
3400	5-p	Sedan		1,995
3450	5-p	Sp. Sedan		2,195
		"g"		
4100	5-p	Phaeton		\$2,485
4315	7-p	Phaeton		2,535
4250	5-p	Sport Phaeton		2,900
4440	5-p	Sedan		3,485
4570	5-p	Sport Sedan		3,750
4555	7-p	Sedan		3,585
AUBURN "6-43"				
2550	5-p	Touring		\$1,095
2672	5-p	Special Touring		1,395
2772	5-p	Sp. Touring		1,465
2850	5-p	Coupe Touring		1,695
2852	5-p	English Coach		1,945
2932	5-p	Sedan		1,795
		"6-63"		
3262	5-p	Touring		1,795
3332	5-p	Sp. Touring		2,035
3562	5-p	Sedan		2,545
3572	5-p	Brougham		2,345
		Sedan		2,545
BARLEY "6" 6-50				
2750	5-p	Touring		\$1,395
2800	5-p	Sp. Touring		1,495
3100	5-p	Sedan		1,850
3150	5-p	Sp. Sedan		2,250
BUICK "Standard"				
2750	2-p	Roadster		\$1,150
2800	2-p	Roadster Encl.		1,190
2920	5-p	Phaeton		1,175
2970	5-p	Phaeton Encl.		1,250
		2-p Business Coupe		1,375
3075	4-p	Coupe		1,565
3185	5-p	Dbl. Service Sedan		1,475
3245	5-p	Regular Sedan		1,665
		"Master		
		(120 in. W. B.)		
3300	2-p	Roadster		\$1,365
		2-p Roadster Encl.		1,400
3455	5-p	Phaeton		1,395
		5-p Phaeton Encl.		1,475
3675	4-p	Coupe		2,125
3845	5-p	Sedan		2,225
		(128 in. W. B.)		
3470	3-p	Sp. Roadster		\$1,750
3605	5-p	Sp. Phaeton		1,800
3645	7-p	Phaeton		1,625
		7-p Phaeton Encl.		1,700
		3-p Country Club		2,075
3940	5-p	Brougham Sedan		2,350
4020	7-p	Sedan		2,425
		7-p Sedan Limousine		2,525
		Town Car		2,925
CADILLAC "V-63"				
4190	4-p	Roadster		\$3,085
4280	7-p	Touring		3,085
4200	4-p	Phaeton		3,085
4270	2-p	Coupe		3,875
4370	5-p	Sp. Coupe		3,950
4600	5-p	Sedan		4,400
4610	7-p	Sedan		3,585
4480	5-p	DeLuxe Sedan		4,150
4530	5-p	Town Brougham		4,600
4640	7-p	Limousine		4,600
4640	7-p	Suburban		4,500
4560	7-p	DeLuxe Suburban		4,250
4380	4-p	Victoria		3,275
4475	5-p	Landau		3,650
CASE "J. I. C."				
3260	3-p	Roadster		\$1,840
3290	5-p	Touring		1,885
		5-p Spec. Touring		2,160
3570	4-p	Sub. Coupe		2,480
3640	5-p	Sedan		2,590
		"X"		
3020	3-p	Roadster		\$1,670
3050	5-p	Touring		1,695
3380	5-p	Sub. Coupe		2,390
3400	5-p	Sedan		2,485
		"Y"		
3975	7-p	Touring		\$2,475
4320	7-p	Sedan		3,325

Ship.	Wt.	Pass.	Body Style	Price
CHALMERS Y				
2865	2-p	Roadster		\$1,185
2950	5-p	Touring		1,185
3095	7-p	Touring		1,295
3095	5-p	Sp. Touring		1,335
3245	5-p	Coach		1,535
3620	7-p	Sedan		2,095
CHEVROLET "Superior"				
1690	2-p	Roadster		\$495
1790	5-p	Touring		510
1955	5-p	Phaeton DeLuxe		640
2005	4-p	Coupe		725
		4-p Coupe DeLuxe		775
1880	2-p	Utility Coupe		640
2070	5-p	Sedan		795
		5-p Sedan DeLuxe		940
CHANDLER SS				
2945	2-p	Roadster		\$1,795
3130	4-p	Roadster		1,785
3160	5-p	Touring		1,585
3218	7-p	Touring		1,735
3250	4-p	Royal Dispatch		1,885
3380	5-p	Chummy Sedan		1,845
		Sedan		1,995
3600	7-p	Sedan		2,195
3480	7-p	Limousine		3,095
CHRYSLER				
2620	4-p	Roadster		\$1,625
2570	5-p	Touring		1,395
2600	5-p	Phaeton		1,495
2800	5-p	Sedan		1,725
2915	5-p	Imperial Sedan		1,995
2855	5-p	Brougham		1,895
CLEVELAND "43"				
2750	5-p	Touring		1,095
2810	5-p	Touring DeLuxe		1,195
2830	3-p	Coupe		1,295
2840	3-p	Spec. Coupe		1,395
2930	5-p	Sedan 2-door		1,395
3040	5-p	Spec. Sedan 4 d.		1,495
COLE MASTER				
3695	4-p	Volante Touring		\$2,325
3765	7-p	West. Tour		2,325
3695	4-p	Aero-Vol-Tour.		2,475
3950	5-p	Brouette Sedan		3,225
4090	7-p	Royal Sedan		3,225
4150	7-p	Royal Limousine		3,325
COLUMBIA				
		2-p Roadster		1,775
2480	5-p	Touring		\$1,175
2485	5-p	Spec. Touring		1,275
2510	2-p	Coupe		1,375
2725	5-p	Coach		1,575
2810	5-p	Sedan		1,775
CUNNINGHAM "V-4"				
4600	7-p	Touring		\$6,300
4500	4-p	Sp. Touring		5,800
4700	4-p	Coupe		7,150
5000	6-p	Sedan		7,650
DAGMAR "6-70"				
3800	4-p	Sp. Touring		\$3,500
4200	4-p	Sedan		4,500
DANIELS "24-38"				
4150	4-p	Touring		\$6,800
4765	7-p	Touring		6,900
4600	4-p	Sedan		7,600
5200	7-p	Sedan		7,800
DAVIS "90"				
2650	3-p	M. O'War Road.		\$1,495
2915	4-p	Legionaire Tour.		1,495
2750	5-p	Phaeton		1,395
3070	5-p	Sedan		1,895
3065	5-p	Berline Sedan		1,995
2700	5-p	Brougham		1,595
		"91"		
2835	3-p	Roadster		1,795
3020	5-p	Phaeton		1,695
3245	5-p	Sedan		2,195
3050	5-p	Brougham		1,895
3215	5-p	Berline Sedan		2,295
DODGE BROTHERS				
2494	2-p	Roadster		\$865
2653	2-p	Spec. Roadster		1,025
2591	5-p	Touring		895
2755	5-p	Spec. Touring		1,055
2793	4-p	Coupe		1,375
2755	2-p	Coupe B		1,035
2929	4-p	Spec. Coupe		1,535
3050	5-p	Sedan B		1,250
3098	5-p	Sedan A		1,385
3190	5-p	Spec. Sedan		1,545
DORRIS "6-80"				
4120	4-p	Pasadena Tour.		\$4,150
4115	7-p	Touring		3,950
4193	4-p	Coupe		4,985
4200	5-p	Sedan		5,550
4310	7-p	Sedan		5,800

Ship.	Wt.	Pass.	Body Style	Price
DORT				
"27"				
2595	5-p	Touring		\$1,095
2780	5-p	Sp. Touring		1,245
3010	5-p	Bres. Coupe		1,385
3030	5-p	Coupe		1,535
3045	5-p	Sedan		1,595
3030	5-p	Brougham		1,535
DUESENBERG				
St. "8"				
3200	2-p	Roadster		\$6,500
3550	5-p	Phaeton		6,250
3750	7-p	Phaeton		6,750
3750	4-p	Sp. Phaeton		6,500
4000	4-p	Coupe		7,500
4350	7-p	Sedan		7,800
DU PONT				
"C"				
3300	2-p	Roadster		\$2,090
3400	5-p	Touring		2,090
3600	5-p	Touring Sedan		3,050
3600	5-p	Suburban Sedan		3,050
DURANT				
"A-22"				
2235	2-p	Roadster		\$1,040
2325	5-p	Touring		890
2345	5-p	Touring F.W.B.		940
2395	5-p	Sp. Touring		1,090
2495	5-p	Coupe		1,340
2405	2-p	Business Coupe		1,035
2605	5-p	Sedan		1,365
2770	5-p	Touring Sedan		1,465
2550		Coach		1,185
ELCAR				
"4-40-41"				
2560	5-p	Touring		\$995
2585	5-p	Demi Sp. Touring		1,095
2641	5-p	Sportster		1,195
2900	5-p	Sedan		1,495
2981	5-p	Sp. Sedan		1,695
2779	5-p	Brougham 3 d.		1,265
2829	5-p	Sp. Brough. 3 d.		1,395
"6-50-51"				
2600	5-p	Demi Sp. Tour.		\$1,220
2690	5-p	Sp. Touring		1,420
2900	5-p	Sedan		1,720
2981	5-p	Sp. Sedan		1,920
2779	5-p	Brougham		1,490
2829	5-p	Sp. Brougham		1,620
"6-61"				
2007	5-p	Touring		\$1,585
3380	5-p	Sedan		2,245
3675	5-p	Sp. Sedan		2,395
3380	4-p	Brougham		1,995
"8-80"				
	3-p	Roadster		2,315
	5-p	Sp. Touring		2,165
	7-p	Sp. Touring		2,265
	7-p	Sedan		2,765
ESSEX				
2130	5-p	Touring		\$900
2305	5-p	Coach		1,000
FLINT				
"55"				
3000	3-p	Sp. Roadster		\$1,630
	5-p	Touring		1,495
-----	4-p	Sp. Touring		1,795
3200	4-p	Coupe		2,095
3575	4-p	Sedan		2,185
"40"				
	5-p	Touring		1,075
FORD				
Without Starter and Dem. Rims				
1395	2-p	Runabout		\$265
1517	5-p	Touring		295
With Starter and Dem. Rims				
1540	2-p	Runabout		\$350
1662	5-p	Touring		380
1772	2-p	Coupe		525
1950	5-p	Sedan, Fordor		685
1898	5-p	Sedan, Tudor		590
FRANKLIN				
"10 C"				
2580	5-p	Touring		\$1,950
2710	4-p	Coupe		2,750
2730	5-p	Sedan		2,850
2655	5-p	Demi-Sedan		2,250
2765	5-p	Brougham		2,850
	5-p	Touring Lim.		2,950
GARDNER				
"Series 5"				
2520	2-p	Roadster		\$945
-----	2-p	Sp. Roadster		1,045
2550	2-p	Radio Roadster		1,135
2555	5-p	Touring		995
-----	5-p	Sp. Touring		1,095
2650	5-p	Tour. DeLuxe		1,145
2750	5-p	Rad. Spec. Tour.		1,145
2895	5-p	Sedan		1,475
3070	5-p	Sp. Sedan		1,595
2680	5-p	Coupe		1,275
GRAY				
"O"				
1755	5-p	Touring		\$630
1785	2-p	Coupe		750
2030	5-p	Sedan		895
HATFIELD				
"6-55"				
3080	4-p	Sport Touring		\$1,775
3225	4-p	Coupe		2,175
3300	5-p	Sedan		2,355

Prices and Weights of Current Passenger Car Models

Ship.	Wt.	Pass.	Body Style	Price
LINCOLN				
4050	2-p	Roadster	\$4,000	
4290	7-p	Touring	4,000	
4215	4-p	Phaeton	4,000	
4380	5-p	Coupe	4,600	
4375	4-p	Sedan	4,800	
4600	5-p	Sedan	4,900	
4650	7-p	Sedan	5,100	
4720	7-p	Limousine	5,300	
LOCOMOBILE				
"48"				
5080	4-p	Sportif Tour.	\$7,400	
5330	7-p	Touring	7,400	
5600	5-	Victoria Sedan	9,990	
5454	7-p	Brougham	9,990	
5640	7-p	Tour. Limousine	9,000	
5868	7-p	Encl. Drive Lim.	9,990	
5624	7-p	Cabriolet	10,250	
McFARLAN				
"6" TV				
4600	2-p	Roadster	\$5,400	
4600	4-p	Sport Touring	5,600	
4700	7-p	Touring	5,700	
4900	4-p	Coupe	6,720	
5200	4-p	Tour. Sedan	6,720	
5200	7-p	Tour. Sedan	6,810	
5200	7-p	Sp. Sedan	6,600	
5200	7-p	Sub. Sedan	7,000	
5100	7-p	Limousine	6,900	
5200	7-p	Town Car	9,000	
"Light 6" SV				
8700	3-p	Roadster	\$2,600	
8700	5-p	Touring	2,600	
8850	4-p	Coupe	3,100	
4850	5-p	Sedan	3,100	
MARMON				
"34"				
3470	2-p	Speedster	\$3,295	
3650	4-p	Speedster	3,295	
3875	4-p	Phaeton	3,095	
3690	7-p	Phaeton	3,095	
3770	4-p	Coupe	3,585	
3970	4-p	Sedan	3,985	
4155	7-p	Sedan	3,985	
4220	7-p	Suburban	4,285	
4100	7-p	Limousine	4,285	
4000	7-p	Town Car	4,285	
MAXWELL				
2135	2-p	Roadster	\$885	
2230	5-p	Touring	895	
2410	5-p	Sp. Touring	1,055	
2230	2-p	Club Coupe	1,025	
2430	5-p	Club Sedan	1,095	
2570	5-p	Sedan	1,325	
2785	5-p	Trav. Sedan	1,585	
MOON				
Series "A"				
2400	4-p	Roadster	\$1,450	
2410	5-p	Sp. Touring	1,395	
2625	5-p	Sedan 2 d	1,695	
2750	5-p	Sedan 4 d	1,795	
"6-40"				
2860	5-p	Touring	\$1,595	
2920	4-p	Coupe	2,035	
2920	5-p	Sedan	2,045	
3090	5-p	Petite Sedan	2,245	
"6-50"				
2850	5-p	Touring	1,695	
3120	5-p	Sedan	2,135	
3190	5-p	Sp. Sedan	2,245	
"6-58"				
3270	5-p	Sp. Touring	2,095	
3590	7-p	Petite Sedan	2,885	
NASH				
"Special"				
2960	5-p	Touring	\$1,095	
3120	5-p	Sedan	1,295	
"Advanced"				
(121 in. W. B.)				
3250	3-p	Roadster	\$1,375	
3250	5-p	Touring	1,375	
3540	5-p	Sedan	1,695	
"Advanced"				
(127 in. W. B.)				
3370	7-p	Touring	\$1,525	
3670	7-p	Sedan	2,290	
3620	4-p	Coupe	2,190	
OAKLAND				
"6-54"				
2420	3-p	Roadster	\$1,095	
2510	3-p	Sp. Roadster	1,195	
2485	5-p	Touring	1,095	
2550	5-p	Sp. Touring	1,195	
2620	3-p	Business Coupe	1,295	
2720	4-p	Coupe	1,495	
2860	5-p	Sedan	1,545	
2860	5-p	Laudau Sedan	1,645	

Ship.	Wt.	Pass.	Body Style	Price
OLDSMOBILE				
"30"				
2145	2-p	Roadster	\$875	
2270	2-p	Sp. Roadster	985	
2170	5-p	Touring	875	
2320	5-p	Sp. Touring	1,015	
2295	2-p	Bus. Coupe	1,045	
2410	4-p	Coupe	1,175	
2570	5-p	Sedan	1,250	
2700	5-p	DeLuxe Sedan	1,350	
OVERLAND				
"91" (100 in. wheelbase)				
1769	2-p	Roadster	\$530	
1863	5-p	Touring	530	
1918	5-p	Touring DeLuxe	560	
2177	2-p	Coupe	695	
2130	5-p	Sedan	850	
2004	5-p	Coupe Sedan	685	
"92" (106 in. wheelbase)				
2047	5-p	Red Bird	\$695	
2044	5-p	Red Bird Spec.	735	
2090	5-p	Blue Bird	725	
2004	5-p	Black Bird	695	
2090	5-p	Black Bird Spec.	735	
PACKARD				
"6" (126 in. W. B.)				
3165	4-p	Roadster	\$2,785	
3320	5-p	Touring	2,585	
3255	4-p	Sp. Touring	2,750	
3400	4-p	Coupe	3,275	
3515	5-p	Coupe	3,450	
3565	5-p	Sedan	3,375	
3610	5-p	Sedan Limousine	3,425	
"6" (133 in. W. B.)				
3430	7-p	Touring	\$2,785	
3690	7-p	Sedan	3,625	
3765	7-p	Sedan Limousine	3,675	
"8" (136 in. W. B.)				
3880	4-p	Runabout	3,850	
3990	5-p	Touring	3,650	
3930	4-p	Sp. Touring	3,800	
4125	4-p	Coupe	4,550	
4200	5-p	Coupe	4,725	
4270	5-p	Sedan	4,650	
4275	5-p	Sedan Limousine	4,700	
"8" (143 in. W. B.)				
4020	7-p	Touring	\$3,850	
4275	7-p	Sedan	4,900	
4350	7-p	Sedan Limousine	4,950	
PAIGE				
3677	4-p	Phaeton	\$1,895	
3742	7-p	Phaeton	1,895	
3880	4-p	Phaeton DeLuxe	2,095	
4040	5-p	Sedan	2,595	
4128	7-p	Sedan	2,595	
4300	7-p	Sub. Limousine	2,895	
4100	5-p	Sedan DeLuxe	2,770	
3900	5-p	Brougham 4 d.	2,175	
4285	7-p	Sedan DeLuxe	2,770	
PEERLESS				
"6-70"				
3050	2-p	Roadster	\$2,350	
3175	5-p	Touring	2,285	
3175	7-p	Touring	2,485	
3550	5-p	Sedan	2,995	
3550	5-p	Coupe	2,950	
3550	7-p	Sedan	3,295	
"8"—66				
3980	4-p	Tour. Phaeton	\$2,690	
4300	5-p	Sedan	2,750	
4355	7-p	Sedan	3,690	
4430	7-p	Berline	3,840	
4130	4-p	Victoria Coupe	4,090	
PIERCE-ARROW				
"33"				
4350	2-p	Runabout	\$5,250	
4590	5-p	Touring	5,250	
4780	3-p	Coupe	6,800	
4830	4-p	Sedan	6,900	
4960	7-p	Sedan	7,000	
4750	4-p	Coupe Sedan	6,900	
4730	6-p	Brougham	6,800	
4850	7-p	Limousine	7,000	
5060	7-p	Enclosed Lim.	7,800	
4780	7-p	French Lim.	7,000	
4732	6-p	Landaulet	7,000	
"80"				
3385	7-p	Phaeton	\$2,895	
3440	5-p	Sedan	3,895	
3625	7-p	Sedan	3,995	
3675	7-p	Enc. Dr. Sedan	4,045	
3360	4-p	Coupe	4,045	
PREMIER				
"6-D"				
3385	7-p	Phaeton	\$2,895	
3440	5-p	Sedan	3,895	
3625	7-p	Sedan	3,995	
3675	7-p	Enc. Dr. Sedan	4,045	
3360	4-p	Coupe	4,045	
REO				
"T-C"				
3172	5-p	Sta. Touring	\$1,395	
3182	5-p	Sport Touring	1,595	
3325	4-p	Coupe	1,875	
3515	5-p	Sedan	1,985	
3695	5-p	Brougham 4 d.	2,235	

Ship.	Wt.	Pass.	Body Style	Price
REVERE				
"M"				
3700	2-p	Roadster	\$3,200	
3500	4-p	Speedster	3,200	
3800	5-p	Touring	3,200	
4300	5-p	Sedan	4,000	
RICKENBACKER				
"C"				
2815	3-p	Sp. Roadster	\$1,645	
2880	5-p	Sp. Touring	1,595	
3050	4-p	Coupe	2,095	
3160	5-p	Sedan	2,195	
"A"				
4-p	Sport phaeton	\$2,195		
4-p	Coupe	2,695		
5-p	Sedan	2,795		
ROAMER				
"6-54-E" (118 in. W. B.)				
3100	2-p	Roadster	\$2,685	
3100	4-p	Tourer	2,485	
3300	4-p	Sp. Touring	2,750	
7-p	Touring	2,685		
3-p	Cabriolet	3,285		
"6-54-E" (138 in. W. B.)				
4100	5-p	Spec. Sedan	\$4,250	
4200	7-p	Suburban-Sedan	3,950	
"4-75-E"				
3650	4-p	Sport	3,650	
"4-85-E"				
3200	2-p	Spec. Speedster	3,785	
ROLLIN				
2300	5-p	Touring	\$995	
2315	3-p	Coupe Roadster	1,195	
2485	5-p	Sedan	1,295	
R & V KNIGHT				
"H"				
3840	4-p	Sp. Roadster	\$2,400	
3800	5-p	Touring	2,300	
3850	7-p	Touring	2,375	
4050	5-p	Coupe	3,000	
4160	5-p	Club Sedan	3,050	
4165	7-p	Sedan	3,250	
ROLLS ROYCE				
Chassis—\$10,895. Prices of complete cars to be obtained from factory, Springfield, Mass.				
STANLEY				
"740"				
3770	5-p	Phaeton	\$2,750	
3910	7-p	Phaeton	2,750	
4075	5-p	Sedan	3,585	
4170	7-p	Sedan	3,985	
STAR				
1700	2-p	Roadster	\$540	
1790	5-p	Touring	540	
1880	5-p	Spec. Touring	640	
1980	2-p	Coupe	695	
2115	5-p	Sedan	785	
2150	5-p	Spec. Sedan	935	
STEARNS-KNIGHT				
"4"				
3775	4-p	Coupe Roadster	\$1,795	
4250	5-p	Touring	1,595	
4250	5-p	Sedan	2,095	
3750	4-p	Coupe Brougham	1,895	
5-p	Brougham	2,095		
"6"				
3775	5-p	Touring	\$2,395	
3850	7-p	Touring	2,495	
4025	2-p	Coupe	3,395	
4275	4-p	Sp. Coupe	3,150	
4275	7-p	Sp. Sedan	3,395	
3950	5-p	Brougham	3,200	
STERLING-KNIGHT				
3200	4-p	Sp. Touring	\$2,250	
3235	5-p	Phaeton	2,150	
2-p	Coupe Road	3,100		
3450	5-p	Sedan	2,800	
3450	4-p	Sp. Brougham	2,750	
STEVENS-DURYEA				
4200	2-p	Roadster	\$8,150	
4400	7-p	Touring	7,500	
4250	4-p	Sp. Touring	7,750	
4600	4-p	Coupe	9,000	
4600	4-p	Sedan	10,000	
4800	6-p	Sedan	9,675	
4800	6-p	Town Brougham	10,175	
4800	6-p	Vestibule Limou.	9,675	
4800	7-p	Vestibule Limou.	10,175	
4800	7-p	1/2 Limousine	10,175	
4800	7-p	Cabriolet	10,175	
STUDEBAKER				
Light Six "EM"				
2510	3-p	Roadster	\$1,025	
2650	5-p	Touring	1,445	
2736	2-p	Coupe	1,195	
2955	5-p	Coupe	1,395	
3030	5-p	Sedan	1,485	
Special Six "EL"				
3065	2-p	Roadster	\$1,400	
3305	5-p	Touring	1,425	
3600	5-p	Coupe	1,895	
3650	5-p	Sedan	1,985	
Big Six "EK"				
3745	5-p	Speedster	\$1,835	
3630	7-p	Touring	1,750	
3770	5-p	Coupe	2,495	
4130	7-p	Sedan	2,685	

Ship.	Wt.	Pass.	Body Style	Price
STUTZ				
"KLDH"				
3600	3-p	Roadster	\$2,450	
3700	3-p	Sp. Roadster	2,765	
3950	5-p	Sp. Touring	2,790	
4100	7-p	Touring	2,640	
4050	5-p	Touring	3,115	
4200	4-p	Coupe	2,990	
4300	4-p	Sp. Coupe	3,250	
"690-2"				
3250	3-p	Roadster	\$1,995	
3350	5-p	Touring	1,995	
3750	5-p	Sedan	2,550	
"695"				
3900	5-p	Sportster	\$2,635	
3950	7-p	Touring	2,685	
4150	5-p	Sedan	3,350	
4350	7-p	Sedan	3,500	
4450	7-p	Berline	3,675	
TEMPLAR				
3300	4-p	Suburban Tour.	\$2,175	
3300	5-p	Phaeton	1,985	
5-p	Sedan	2,785		
4-p	Brougham	2,650		
VELIE				
"56"				
2780	5-p	Touring	\$1,095	
3110	5-p	Sedan	1,595	
"58"				
2780	5-p	Touring	1,275	
3000	5-p	Sp. Touring	1,565	
3780	5-p	Silver Swallow	1,645	
2895	5-p	DeLuxe Touring	1,495	
2970	4-p	Coupe	1,845	

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

MAKE AND MODEL		Wheelbase (Ins.)	TIRES		ENGINE										Electrical System		Clutch	Gear-set	Universal Joints	REAR AXLE		BRAKES				Steering Gear	Rear Springs			
			Standard Size (Ins.)	Ballon Equipment	Make	Model	Number of Cylinders, Bore and Stroke (Ins.)	Rated Horsepower, N.A.C.C.	Valve Arrangement	Piston Material	Number of Main Crankshaft Bearings	Oiling System	Carburetor Make	Ignition System Make	Generator and Starter Make	Type and Make				Make	Type and Make	Type and Make	Gear Ratio	Foot, Type and Location	Hand, Type and Location			Four Wheel Brake Type	Make	Type and Length
American D-66	127	33x4 1/2	No	H-Sp	91	6-3 1/2 x 5	29.40	L	C	3	PS	Str	A-K	G-D	P-B&B	War	M-Har	F-Sal	5.10	E-R	I-R	None	Lav	2-57 1/2						
Anderson 41	115	32x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Zen	Wes	Wes	P-B&B	Dur	F-Thi	4 1/2 Sal	4.75	E-R	E-T	Mec*	Gen	2-58						
Anderson 50	122	32x4	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Zen	Wes	Wes	P-B&B	Dur	F-Thi	4 1/2 Sal	4.62	E-R	E-T	Mec*	Gen	2-58						
Apperson 6	120	32x4	Yes*	Fall	T8000	6-3 1/2 x 4 1/2	23.44	L	C	3	PS	Str	Rem	Rem	P-Roc	Mec	M-Thi	4 1/2 Col	5.10	E-R	I-R	Mec*	Own	1-48						
Apperson 8	130	33x5	No	Own	8	8-3 1/2 x 5	33.80	L	C	4	PC	Str	Joh	Rem	Bij	D-Own	M-Thi	4 1/2 Col	4.25	E-R	E-T	Mec*	Own	1-48						
Auburn 6-43	114	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	Rem	Rem	P-B&B	War	M-Uni	4 1/2 Col	4.63	E-R	E-T	Mec*	Jac	2-57						
Auburn 6-63	122	32x4 1/2	Yes*	Weid	Spec	6-3 1/2 x 5	25.35	L	C	3	PC	Str	Rem	Rem	P-B&B	War	M-Thi	4 1/2 Col	4.63	E-R	E-T	Mec*	Jac	2-57						
Barley 6-50	118	32x4	No	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	Mar	Del	Del	P-B&B	Ful	R-M&E	1/2 Col	5.11	E-R	I-R	None	Jac	2-56					
Buick "Standard"	114 1/2	31x4 1/2	Yes	Own	Sta	6-3 1/2 x 4 1/2	21.60	L	C	4	PC	Mar	Del	Del	D-Own	Own	M-Own	3/4 Own	4.66	E-F	I-R	Mec	Jac	2-55 1/2						
Buick "Master"	120	32x5 1/2	No	Own	6	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Mar	Del	Del	D-Own	Own	M-Own	3/4 Own	4.10	E-F	I-R	Mec	Jac	2-56 1/2						
Cadillac V-63	132	33x5	Yes*	Own	63	8-3 1/2 x 5 1/2	31.25	L	C	4	PC	Own	De	De	D-Own	Own	M-Spi	F-Own	4.50	B-F	I-R	Mec	Own	2-54						
Case X	122	32x4 1/2	Yes	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Sch	Del	Del	D-Own	Own	R-Sue	1/2 Col	4.90	E-R	I-R	Hyd*	Lav	2-55						
Case JIC	122	32x4 1/2	Yes	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Sch	Del	Del	D-Own	Own	R-Sue	1/2 Col	4.90	E-R	I-R	Hyd*	Lav	2-55						
Case Y	132	33x5	No	Own	6T	6-3 1/2 x 5	33.75	L	C	4	PC	Sch	Del	Del	D-Own	Own	R-Sue	1/2 Col	4.45	E-R	I-R	None	Lav	2-57						
Chalmers Y	117	32x4	No	Own	6	6-3 1/2 x 4 1/2	25.35	L	A	3	PS	Str	A-L	A-L	P-Mec	War	M-Mec	1/2 Tim	5.13	E-R	I-R	Hyd*	Gen	2-56						
Chalmers Y	122	33x4 1/2	No	Own	6	6-3 1/2 x 4 1/2	25.35	L	A	3	PS	Str	A-L	A-L	P-Mec	War	M-Mec	1/2 Tim	5.13	E-R	I-R	Hyd*	Gen	2-56						
Chandler SS	123	31x6 2	Yes	Own	6	6-3 1/2 x 5	29.40	L	C	3	PC	Sch	Bos	Bos	P-B&B	Own	M-The	F-Own	4.45	E-R	E-T	Mec*	Own	2-58 1/2						
Chevrolet Superior	103	30x3 1/2	No	Own	6	4-3 1/2 x 4	21.76	L	C	3	PS	(Zen)	Rem	Rem	K-Own	Own	M-Own	1/2 Own	3.77	E-R	I-R	None	Own	2-28						
Chrysler Six	112 3/4	30x5 1/2	Yes	Own	43	6-3 1/2 x 4 1/2	21.60	L	A	7	FP	Str	Rem	Rem	D-Own	Own	M-Own	1/2 Own	4.60	E-F	E-T	Hyd	Jax	2-51 1/2						
Cleveland 43	115	31x5 2	Yes	Own	311	6-3 1/2 x 4 1/2	23.44	L	A	3	PC	Sch	Bos	Bos	P-B&B	Own	R-Sne	1/2 Own	4.90	E-R	E-T	Mec*	CAS	2-53						
Cole Master	127 1/2	20x7 3	Yes*	Nort	311	8-3 1/2 x 5 1/2	39.20	L	A	3	PC	Sch	Bos	Bos	D-Nor	Nor	M-Spi	F-Col	4.70	E-R	I-R	None	Gen	2-57						
Columbia 115	115	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	A-L	A-L	P-B&B	Dur	M-Spi	1/2 Tim	4.80	E-R	E-T	Hyd*	Gen	2-57						
Crawford 6-70	138	33x4 1/2	No	Cont	6T	6-3 1/2 x 5 1/2	31.54	L	C	4	PC	Zen	Wes	Wes	D-B-L	B-L	M-Spi	1/2 Tim	5.00	E-R	I-R	None	Lav	2-58						
Cunningham V4	132	33x5	No	Own	V4	8-3 1/2 x 5	45.00	L	C	3	FP	Str	Del	Del	D-Own	Own	R-Sue	F-Tim	4.23	E-R	I-R	None	Gen	2-62						
Dagmar 6-70	138	33x5	No	Own	6T	6-3 1/2 x 5 1/2	31.54	L	C	4	PC	Zen	Wes	Bos	D-B-L	B-L	M-Spi	1/2 Tim	5.00	E-R	I-R	None	Lav	2-58						
Daniels 24-38	138	33x5	Yes*	Cont	24-38	8-3 1/2 x 5 1/2	39.20	L	C	3	PC	Zen	Del	Del	P-Own	Own	M-Spi	F-Tim	4.23	E-R	I-R	None	Gen	2-58						
Davis 90	115	31x4	Yes*	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	Del	Del	P-B&B	W-G	M-Pet	1/2 Tim	5.10	E-F	I-R	Hyd	Ros	2-52						
Davis 91	118	32x4 1/2	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Str	Del	Del	P-B&B	W-G	M-Pet	1/2 Tim	5.10	E-F	I-R	Hyd	Ros	2-52						
Dodge Brothers 116	116	32x4	Yes*	Own	4-3 1/2 x 4 1/2	24.03	L	A	3	PS	Ste	N-E	N-E	D-Own	Own	M-Own	1/2 Own	4.54	E-R	I-R	None	Own	2-50							
Dort 27	115	31x4	Yes*	Fall	T8000	6-3 1/2 x 4 1/2	23.41	L	C	3	PC	Sch	Bos	Bos	D-Dtl	Own	M-The	3/4 Fl	4.66	E-R	I-R	None	Gen	2-50						
Duesenberg Straight 8	134	33x5	No	Own	8	8-2 1/2 x 5	26.45	L	A	3	PC	Str	Del	Del	P-Own	Own	R-Chi	1/2 Own	4.90	E-F	E-T	Hyd	Lav	2-58						
Dupont C	124	32x4 1/2	No	H-Sp	90	6-3 1/2 x 5	29.40	L	C	3	PC	Str	Wes	Wes	D-B-L	B-L	M-Spi	F-Col	4.45	E-R	I-R	None	Jac	2-58						
Durant A-22	109	31x4	Yes*	Cont	Spec	4-3 1/2 x 4 1/2	24.03	L	A	3	PC	Til	A-L	A-L	P-Own	War	M-Spi	3/4 Ad	4.33	E-R	I-R	Mec*	War	2-50 1/2						
Elcar 6-41	112	31x4	No	Lyc	CF	4-3 1/2 x 5	21.03	L	A	5	PC	Zen	Del	Del	A-L	A-L	P-B&B	W-G	M-Mec	1/2 Sal	4.70	E-R	I-R	Mec*	Ros	2-51				
Elcar 6-51	113	31x4	No	Cont	7U	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Str	Del	Del	A-L	A-L	P-B&B	W-G	M-Mec	1/2 Sal	4.70	E-R	E-T	Mec*	Ros	2-51				
Elcar 6-61	118	32x4	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Str	Del	Del	P-B&B	W-G	M-Har	1/2 Sal	4.70	E-R	I-R	Mec*	Ros	2-52						
Elcar 8-80	127	32x6 2	Yes	Lyc	8	8-3 1/2 x 4 1/2	31.25	L	C	5	PS	Ste	Bos	Bos	P-B&B	W-G	M-M	1/2 Sal	4.71	E-F	I-R	Hyd	Ros	2-52						
Essex 6	110 1/2	31x5 2	Yes	Own	6	6-2 1/2 x 4 1/2	17.32	L	A	3	Sp	Ste	Bos	Bos	D-Own	Own	M-Spi	1/2 Own	5.60	E-R	I-R	None	Own	2-54 1/2						
Flint 40	115	30x5 2	Yes	Own	40	6-3 1/2 x 4 1/2	23.44	L	C	4	PC	Til	A-L	A-L	P-Own	War	M-Spi	1/2 Ad	4.77	E-F	E-F	Mec*	War	2-54						
Flint 55	120	32x4 1/2	Yes*	Cont	Spec	6-3 1/2 x 5	27.34	L	C	7	PC	Str	Del	Del	P-Own	Own	M-Spi	1/2 Ad	4.77	E-F	E-F	Mec*	War	2-54						
Ford T	100	30x3 1/2	No	Own	T	4-3 1/2 x 4	22.50	L	C	3	Sp	(Own)	Del	Del	D-Own	Own	M-Own	1/2 Own	3.63	E-T	I-R	None	Own	2-43 1/2						
Franklin 10 C	115	32x4 9	Yes*	Own	10-C	6-3 1/2 x 4	25.35	L	A	7	PC	Str	A-K	A-K	P-M&E	Own	M-Spi	1/2 Own	4.73	E-T	E-R	None	Own	2-38						
Gardner Series 5	112	32x4	Yes*	Lyc	CE	4-3 1/2 x 5	21.76	L	A	5	PC	Zen	Wes	Wes	P-B&B	Mec	M-Pet	3/4 Fl	4.80	I-R	I-R	None	Ros	2-51						
Gray 0	104	30x3 1/2	Yes*	Own	R	4-3 1/2 x 4	21.03	L	A	3	Sp	Ste	Wes	Wes	P-Own	Own	R-Sne	3/4 Tim	3.90	I-R	I-R	None	Own	2-30						
H.C.S. Series 4	120	32x4 1/2	No	Weid	Spec	4-3 1/2 x 5 1/2	22.50	L	C	3	PS	Str	Del	Del	D-B-L	B-L	M-Spi	1/2 Own	4.63	I-R	I-R	None	Gen	2-56						
H.C.S. Series 6	126	32x5	Yes*	Own	40	6-3 1/2 x 5	29.40	L	C	3	FP	Str	Del	Del	D-B-L	B-L	M-Spi	3/4 Own	4.63	I-R	I-R	None	Gen	2-56						
Hatfield 6-35	121	32x4	No	H-Sp	40	6-3 1/2 x 5	25.35	L	C	3	PS	Str	Bos	Bos	P-B&B	Dur	M-Spi	1/2 Col	4.63	E-R	I-R	None	Gen	2-58						
Haynes 60	121	33x5 7	Yes	Own	60	6-3 1/2 x 4 1/2	29.40	L	C	3	PS	Ray	Kin	L-N	D-Own	Mec	M-Thi	1/2 Own	4.41	E-R	E-T	None	Jac	2-54 1/2						
Hudson Super 6	127	33x6 2	Yes	Own	6	6-3 1/2 x 5	29.40	L	A	4	Sp	Ste	Bos	Bos	D-Own	Own	M-Spi	F-Tim	4.45	E-R	I-R	None	Gen	2-58						
Hupmobile Series R	115	32x																												

Brake Superiorities

Thirty manufacturers have passed by all other four-wheel brake applications and are successfully utilizing the engineering superiorities, the production assembly advantages and the sales opportunities afforded by Lockheed Hydraulic Four-Wheel Brakes.

Dealers everywhere are appreciating more and more keenly the far greater sales leverage, the invaluable advertis-

ing and lessened service requirements of Lockheed Brakes.

Lockheed Hydraulics are satisfying engineer, manufacturer and dealer.

The car owner finds in Lockheed a new sense of safety, in having at his instant command a positive power of deceleration equal to his engine's power of acceleration.

HYDRAULIC BRAKE COMPANY
5835 RUSSELL ST. DETROIT, MICH.

LOCKHEED

Hydraulic Four Wheel Brakes

Current Passenger Car Specifications

(This list comprises cars distributed on a national basis)

MAKE AND MODEL		Wheelbase (Ins.)	TIRES		ENGINE										Electrical System		Clutch	Gear-set	Universal Joints	REAR AXLE		BRAKES				Steering Gear	Rear Spring
			Standard Size (Ins.)	Ballon Equipment	Make	Model	Number of Cylinders, Bore and Stroke (Ins.)	Rated Horsepower, N.A.C.C.	Valve Arrangement	Piston Material	Number of Main Crankshaft Bearings	Oiling System	Carburetor Make	Ignition System Make	Generator and Starter Make	Type and Make				Make	Type and Make	Type and Make	Gear Ratio	Foot, Type and Location	Hand, Type and Location			Four Wheel Brake Type	Make	Type and Length
Paige	131	33x4 1/2	Yes*	Cont	Spec	6-3 1/4 x 5	33.75	L	C	4	PC	Ray	A-K	Rem	D-Lon	W-G	M-Mec	1 1/2 Tim	4.90	E-R	I-R	None	Gem	8-61 1/2			
Peerless	70	126	33x6	2	Yes*	Own	70	6-3 1/2 x 5	29.40	L	7	PC	Joh	Del	D-Own	Own	M-Spi	1 1/2 Tim	4.66	E-F	I-R	Hyd	Gem	8-54		
Peerless	66	128	33x5	Yes*	Own	66	8-3 1/4 x 5	33.80	L	C	3	PC	Bal	Del	D-Own	Own	M-Spi	3/4 Tim	4.90	E-R	I-R	Hyd*	Gem	8-60			
Pierce-Arrow	33	138	33x5	No	Own	33	6-4 x 5 1/2	38.40	T	C	7	FP	Own	Del	D-Own	Own	M-Spi	1 1/2 Tim	4.29	E-R	I-R	Mec*	Gem	8-57 1/2			
Pierce-Arrow	"80"	130	32x5 7/8	Yes	Own	"80"	6-3 1/2 x 5	29.40	L	C	7	PC	Own	Del	P-B&B	B-L	M-Spi	1 1/2 Tim	4.45	I-F	I-R	Mec	Gem	8-56 1/2			
Premier	6-D	126 3/4	32x4 1/2	Yes*	Own	6-D	6-3 1/2 x 5 1/2	27.34	I	A	3	PC	Str	Del	P-B&B	Own	M-Blo	1 1/2 Col	4.70	E-R	I-R	Mec*	Gem	8-57 1/2			
R&V Knight	11	124	32x4 1/2	No	Own	Kni	6-3 1/2 x 4 1/2	29.40	X	C	4	PC	Sch	A-L	P-B-L	B-L	M-Spi	1 1/2 Tim	5.40	E-R	I-R	None	Jac	8-61			
Reo	T6	120	32x6	Yes	Own	T6	6-3 1/2 x 5	24.34	G	A	4	PS	Sch	NE	D-Own	Own	(M-Own)	1 1/2 Own	4.70	E-R	I-R	None	None	8-54 1/2			
Revere	M	131	32x4 1/2	Yes*	Mons	4	4-4 1/2 x 6	30.63	H	A	2	PS	Str	Bos	D-B-L	B-L	M-Spi	3/4 Stn	3.44	E-R	I-R	None	Gem	8-58			
Rickenbacker	C	117	32x4	Yes*	Own	C	6-3 1/4 x 4 1/2	23.44	L	C	3	PC	Str	Bos	D-Own	W-G	M-Mec	1 1/2 Own	4.63	I-F	E-T	Mec	Gem	8-57			
Rickenbacker	A	121 1/2	33x4 1/2	Yes*	Own	A	8-3 x 4 1/2	28.60	L	9	PC	Zen	Bos	Del	M-Own	W-G	M-Mec	1 1/2 Own	5.10	I-F	E-T	Mec	Gem	8-59		
Roamer	6-54-E	118	32x4 1/2	No	Cont	12XD	6-3 1/2 x 5 1/2	29.40	L	A	3	PS	Str	Spl	Wes	P-B&B	Ful	R-M&E	3/4 Tim	4.60	E-R	I-R	Mec*	Jac	V-55 1/2		
Roamer	4-75-F	128	32x4 1/2	No	Dues	G1	4-4 1/2 x 6	28.90	H	A	3	FP	Str	Bos	D-B-L	B-L	R-M&E	3/4 Tim	4.63	E-R	I-R	Mec*	Jac	V-55 1/2			
Rollin	G	112	21x5 1/2	Yes	Own	G	4-3 1/2 x 4 1/2	16.90	L	A	4	PC	Til	Con	P-B&B	Mun	R-Sue	1 1/2 Sal	5.10	E-F	E-F	Mec	Dit	0-46 1/2			
Rolls-Royce	40-50	143 1/2	33x5	No	Own	40	6-4 1/2 x 4 1/2	48.60	L	A	7	FP	Own	Bos	K-Own	Own	M-Own	F Own	3.72	I-R	I-R	None	None	V-54 1/2			
Stanley	750	130	33x5 7/8	Yes	Own	750	2-4 x 5	13.00	X	C	2	Non	Non	Bij	Non	Non	Non	1 1/2 Own	4.50	E-R	I-R	None	None	8-40 1/2			
Star	4	102	30x4.9	Yes	Cont	Spec	4-3 1/2 x 4 1/2	15.63	L	C	3	PS	Til	A-L	A-L	P-Own	War	M-Spi	3/4 Ad	4.87	E-R	I-R	Mec*	War	8-40 1/2		
Stearns-Knight	SKL4	119	33x4 1/2	No	Own	Kni	4-3 1/2 x 5 1/2	22.50	X	C	4	PC	Sch	A-K	A-L	D-Own	R-Cl	1 1/2 Own	4.50	E-R	I-R	Hyd*	None	V-50			
Stearns-Knight	6	130	33x5	No	Own	Kni	6-3 1/2 x 5	25.35	X	C	4	PC	Sch	A-K	A-L	D-Own	Own	R-Cl	1 1/2 Own	4.70	E-R	I-R	Hyd*	None	V-50		
Sterling-Knight	125	32x4 1/2	Yes*	Own	Kni	6-3 1/2 x 4 1/2	25.35	X	C	7	FP	Str	Wes	Bos	D-Ful	Ful	R-Cl	1 1/2 Tim	4.66	E-R	I-R	Mec*	Ros	8-58			
Stevens Duryea	G	138	33x5	No	Own	G	6-4 1/2 x 5 1/2	47.25	L	C	4	PC	Str	Bos	D-B-L	B-L	M-Spi	F Tim	3.76	E-R	I-R	None	Ros	8-57 1/2			
Studebaker	Light Six	112	31x4	Yes*	Own	EM	6-3 1/2 x 4 1/2	23.44	L	C	4	PS	Str	(Wag)	(Wag)	P-Own	Own	R-The	1 1/2 Own	5.00	E-R	I-R	None	Own	8-50		
Studebaker	Spec. Six	119	32x4	Yes*	Own	EL	6-3 1/2 x 5	29.40	L	C	4	PS	Str	(Wag)	(Wag)	P-Own	Own	M-Spi	1 1/2 Own	4.33	E-R	I-R	None	Own	8-56		
Studebaker	Big Six	126	33x4 1/2	Yes*	Own	EK	6-3 1/2 x 5	36.04	L	C	4	PS	Bal	(Wag)	(Wag)	P-Own	Own	M-Spi	1 1/2 Own	3.71	E-R	I-R	None	Own	8-56		
Stutz	690-2	120	32x4	Yes*	Own	691	6-3 1/2 x 5	29.40	I	C	3	PC	Str	Rem	P-B&B	W-G	M-Mec	1 1/2 Tim	5.10	E-R	I-R	None	Gem	61 1/2			
Stutz	KLD1	130	32x4 1/2	No	Own	KLH	4-4 1/2 x 6	30.63	T	C	3	PC	Str	Del	D-W-G	Own	M-Har	1 1/2 Own	3.75	I-R	I-R	None	Gem	8-60			
Stutz	695	130	32x4 1/2	Yes*	Own	691	6-3 1/2 x 5	29.40	I	C	3	PC	Str	Rem	P-B&B	W-G	M-Mec	1 1/2 Tim	4.66	E-R	I-R	Hyd*	Gem	8-61 1/2			
Templar	122	33x4	No	Own			6-3 1/2 x 5	27.34	L	C	PS	T1	Dyn	Dyn	P-M&E	War	R-Sne	3/4 Sal	5.10	I-F	E-T	Mec	Ros	8-54		
Velie	60	118	32x5 1/2	Yes*	Own	56	6-3 1/2 x 4 1/2	24.38	I	C	4	FP	Str	Wes	Wes	P-B&B	Dur	M-Thi	1 1/2 Own	5.10	E-F	I-R	Hyd	Ros	8-55		
Westcott	48	125	32x4 1/2	Yes*	Cont	12X	6-3 1/2 x 5 1/2	29.40	L	A	3	PS	Ray	Del	P-B&B	B-L	M-Pet	1 1/2 Tim	4.45	E-R	I-R	Mec*	Gem	8-59			
Westcott	44	120	32x4 1/2	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Str	Del	P-B&B	War	M-Pet	1 1/2 Col	4.90	E-R	E-T	Mec*	Gem	8-57 1/2			
Westcott	6	118	32x4	Yes*	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Str	Del	P-M&E	War	M-Pet	1 1/2 Col	4.63	E-R	E-T	Mec*	Gem	8-56			
Wills Ste. Claire. A&B6	121	32x4 1/2	Yes*	Own	A68	8-3 1/4 x 4	33.80	I	C	3	FP	(Zen)	De	De	P-Own	Own	M-Spi	1 1/2 Eat	4.45	(E-R)	(I-R)	(None)	None	8-54 1/2			
Wills Knight	64&6	118	33x4.9	Yes	Own	64	4-3 1/2 x 4 1/2	21.03	X	C	3	PS	Til	A-L	A-L	D-Own	Own	R-Own	1/4 Own	14.44	E-R	I-R	None	Own	8-55		
Wills Knight	112	124	33x5.7	Yes	Own																						
TAXICABS																											
Checker	117	33x4 1/2	No	Buda	WTU	4-3 1/2 x 5 1/2	22.50	L	C	3	PC	Zen	Sci	Wes	D-Ful	Ful	Blo	3/4 Col	4.87	E-R	I-R	None	Jon	8-57 1/2			
Driggs	108 1/2	30x3 1/2	No	Own		4-2 1/2 x 4 1/2	11.03	L	C	....	PS	Zen	Bos	Bos	D-Ful	Ful	Spi	3/4 Own	4.74	E-R	I-R	None	Own	8-		
Elcar	4	118	33x4 1/2	No	Lycs	CF	4-3 1/2 x 5	21.03	L	A	5	PC	Car	A-L	A-L	P-B&B	Mun	Pet	3/4 Sal	4.75	E-R	I-R	None	CAS	8-51		
Elcar	6	118	33x4 1/2	No	Cont	8R	6-3 1/2 x 4 1/2	27.34	L	C	4	PC	Str	Del	P-B&B	War	Pet	3/4 Sal	4.75	E-R	I-R	None	Gem	8-52			
Kelsey	E	112	32x4	No	Lycs	CH	4-3 1/2 x 5	19.00	L	A	5	PC	Zen	Bos	Bos	P-B&B	W-M	M-Spi	3/4 Sal	5.10	E-R	I-R	None	Lav	8-55		
Pennant	115	33x4 1/2	No	Buda	WTU	4-3 1/2 x 5 1/2	22.50	L	B	3	PC	Zen	Bos	Bos	D-Ful	Ful	Blo	3/4 Col	4.87	E-R	I-R	None	Jon	8-57			
Pennant	Premier	4A	33x4 1/2	No	Buda	WTU	4-3 1/2 x 5 1/2	22.50	L	B	3	PC	Zen	Bos	D-Ful	Ful	Blo	3/4 Col	4.70	E-R	I-R	None	Jon	8-57 1/2			
Rauch & Lang	T	112	32x4	No	Buda	WTU	4-3 1/2 x 5 1/2	22.50	L	B	3	PC	Zen	Bos	Dynf	P-Det	Det	Spi	1 1/2 Sta	5.10	E-R	E-T	None	Gem	8-50 1/2		
Rauch & Lang	Reo	102	33x4 1/2	No	Own	Electric									None	None	None	Own	Own	Own	Own	None	None	8-55			
Reo	V	118	33x4 1/2	Yes*	Own	T-6	6-3 1/2 x 5	24.30	G	A	4	PS	Sch	N-E	N-E	D-Own	None	None	1 1/2 Own	4.70	E-R	I-R	None	None	8-55		
Traveler	108 1/2	32x4	No	Buda	WTU	4-3 1/2 x 5 1/2	22.50	L	B	3	PC	Zen	Eis	Eis	B-L	W-M	Spi	Col	E-R	I-R	None	Gem	8-		
White	15A	119	34x4 1/2	No	Own		4-3 1/2 x 5 1/2	22.50	L	C	Sp	Zen	Opt	Opt	P-Own	Own	Own	1 1/2 Own	5.12	E-R	I-R	None	Own	J-		
Willys Knight	A.B.C.	118	32x4 1/2	Yes*	Own	64	4-3 1/2 x 4 1/2	21.03	X	C	3	PS	Til	A-L	A-L	D-Own	Own	Own	3/4 Own	5.12	E-R	I-R	None	None	8-55		
Yellow	0-4	109	32x4 1/2	No	Cont	V7	4-3 1/2 x 5	22.50	L	C	3	PC	Zen	Bos	N-E†	D-B-L	B-L	Spi	3/4 Tim	4.90	E-R	E-T	None	Gem	56		
Yellow	A-2	109	29x4 1/2	Yes	Cont	V7	4-3 1/2 x 5	22.50	L	C	3	PC	Zen	Bos	N-E†	D-B-L	B-L	Spi	3/4 Tim	4.90	E-R	E-T	None	Gem	56		

TAXICABS

Checker.....	117	33x4½	No	Buda	WTU	4-3¼x5½	22.50	L	C	3	PC	Zen	Sci	Wes	D-Ful	Ful	Blo	¾-Col	4.87	E-R	I-R	None	Jon	8-57½	
Driggs.....	108½	30x3½	No	Own		4-2½x4½	11.03	L	C		PS	Zen	Bos	Bos	D-Ful	Ful	Spi	¾ Own	4.74	E-R	I-R	None	Own	8-	
Elcar.....	118	33x4½	No	Lycor	CF	4-3½x5	21.03	L	A	5	PC	Car	A-L	A-L	P-B&B	Mun	Pet	¾ Sal	4.75	E-R	I-R	None	CAS	8-51	
Elcar.....	118	33x4½	No	Cont	8R	6-3½x4½	27.34	L	C	4	PC	Str	Del	Del	P-B&B	War	Spi	¾ Sal	4.75	E-R	I-R	None	Gem	8-52	
Kelsey.....	112	32x4	No	Lycor	CH	4-3½x5	19.60	L	A	5	PC	Zen	Bos	Bos	P-B&B	W-M	M-Spi	¾ Sal	5.10	E-R	I-R	None	Lav	8-55	
Pennant.....	115	33x4½	No	Buda	WTU	4-3¼x5½	22.50	L	B	3	PC	Zen	Bos	Bos	D-Ful	Ful	Blo	¾-Col	4.87	E-R	I-R	None	Jon	8-57	
Pennant.....	118	33x4½	No	Buda	WTU	4-3¼x5½	22.50	L	B	3	PC	Zen	Bos	Bos	D-Ful	Ful	Blo	¾-Col	4.70	E-R	I-R	None	Ros	8-57½	
Rauch & Lang.....	112	32x4	No	Buda	WTU	4-3¼x5½	22.50	L	B	3	PC	Zen	Bos	Dynf	P-Det	Det	Spi	½ Sta	5.10	E-R	E-T	None	Gem	8-50½	
Rauch & Lang.....	102	33x4½	No	Own		Electric									None	None	Own	Own	8.60			None	None	8-	
Reo.....	113	33x4½	Yes*	Own	T-6	6-3½x5	24.30	G	A	4	PS	Sch	N-E	N-E	D-Own	Own	Own	½ Own	4.70	E-R	I-R	None	Own	8-55	
Traveler.....	108½	32x4	No	Buda	WTU	4-3¼x5½	22.50	L	B	3	PC	Zen	Eis	Eis	B-L	W-M	Spi	Col			E-R	I-R	None	Gem	8-
White.....	119	34x4½	No	Own		4-3¼x5½	22.50	L	C	3	Sp	Zen	Opt	Opt	P-Own	Own	Own	½ Own	5.12	E-R	I-R	None	Own	J-	
Willys Knight.....	A.B.C.	118	32x4½	Yes*	Own	64	4-3½x4½	21.03	X	C	3	PS	Til	A-L	D-Own	Own	Own	¾ Own	5.12	E-R	I-R	None	Own	8-55	
Yellow.....	O-4	109	32x4½	No	Cont	V7	4-3¼x5	22.50	L	C	3	PC	Zen	Bos	N-E†	D-B-L	B-L	Spi	¾ Tim	4.90	E-R	E-T	None	Gem	56
Yellow.....	A-2	109	29x4½	Yes	Cont	V7	4-3¼x5	22.50	L	C	3	PC	Zen	Bos	N-E†	D-B-L	B-L	Spi	¾ Tim	4.90	E-R	E-T	None	Gem	56

ABBREVIATIONS—

*—Electric
 †—Generator only
 *—At extra cost
 †—On Phaeton models
 A—Aluminum
 Anst—Ansted
 Ad—Adams
 A-K—Atwater-Kent
 A-L—Auto-Lite
 B—Semi Steel
 Bal—Ball & Ball
 B & B—Borg & Beck
 B-F—Both Internal and External Four Wheels
 Bij—Bijur
 B-L—Brown-Lipe
 Blo—Blood
 Bos—Bosch
 C—Cast Iron
 Car—Carter
 Chi—Climax
 Col—Columbia
 Con—Connecticut
 Cont—Continental

D—Multiple Disk
 Del—Delco
 Det—Detroit
 De J—De Jon
 Dit—Ditwiler
 Doo—Dooley
 Dtl—Detlaff
 Dues—Duesenberg
 Dur—Durstun
 Dyn—Dyneto
 E—Full Elliptic
 E-F—External Four Wheels
 E-R—External Rear Wheels
 E-T—External Transmission
 Eat—Eaton
 F—Full Floating
 Fall—Falls
 Flt—Flint
 FP—Full Pressure to all bearings including wrist pins
 Ful—Fuller
 1/4 F—Semi-Floating
 3/4 F—Three-Quarter Floating
 G—Head and Side
 G-D—Gray & Davis
 Gem—Gemmer

G-L—Grant-Less
 Goo—Goodrich
 H—Horizontal
 Har—Hart
 Hol—Holley
 Hoo—Hoosier
 H-Sp—Herschell-Spillman
 Hyd—Hydraulic
 I—In Head
 I-F—Internal Four Wheels
 I-R—Internal Rear Wheels
 J—Three-Quarter Elliptic
 Jac—Jacox
 Jax—Jaxon
 Joh—Johnson
 Jon—Jones
 K—Cone
 Kin—Kingston
 L—L Head
 Lav—Lavine
 Lon—Long
 L-N—Leece-Neville
 Lyco—Lycoming
 Mar—Marvel
 M—Mera
 M & E—Merchant & Evans

Mec—Mechanics
 Mons—Monson
 Mun—Muncie
 N—Platform
 Non—None
 N. E.—North East
 Nor—Northway
 O—Special Type
 Opt—Optional
 P—Single Plate
 PC—Pressure to all Crankshaft and connecting rod bearings
 Pen—Penfield
 Pet—Peters
 Pie—Pick
 PS—Splash with Pressure
 Q—Quarter Elliptic
 R—Rabrie
 Ray—Rayfield
 Rem—Remy
 Roe—Rockford
 Ros—Ross
 S—Semi Elliptic
 Sal—Salsbury
 Sch—Schebler
 Sci—Scintilla

Sco—Scoe
 Sne—Snead
 Sp—Circulating Splash
 Spe—Special
 Spi—Spicer
 Spl—Splitdorf
 S. E.—Standard Equipment
 Sta—Standard
 Ste—Stewart
 Str—Stromberg
 T—T Head
 The—Thermoid
 Thi—Thierner
 Til—Tillotson
 Tim—Timken
 Uni—Universal
 V—Cantilever
 W-G—Warner Gear
 W-M—Willys-Morrow
 Wag—Wagner
 War—Warner
 Weid—Weidely
 Wes—Westinghouse
 Wis—Wisconsin
 X—Sleeve
 Zen—Zenith

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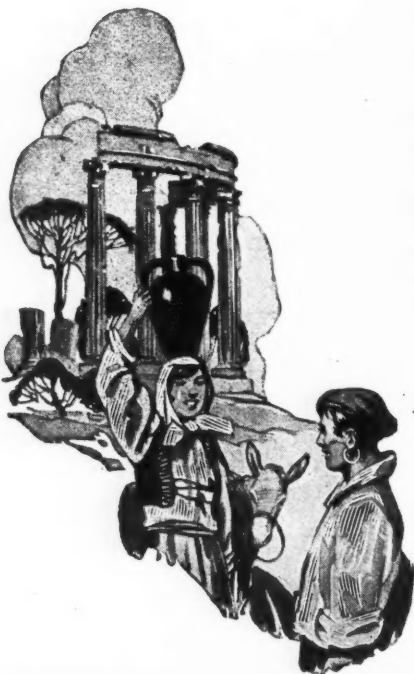
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Stabilators give to every motorist the power to take rough roads in comfort, at almost any chosen speed—in safety. Stabilators protect driver, passengers and car. The master car-builders of Italy recognized it. And every ISOTTA FRASCHINI is now Stabilated before it leaves the factory.

This verdict in favor of Watson Stabilators follows that of nine of America's finest cars, including Packard, Franklin, Duesenberg, Marmon. There can be no higher authority on the subject of Easy Riding than these eminent builders. It is safe for you to follow.

We are sincerely anxious to tell you, show you, and prove all that Stabilators can do to help you. Allow us to demonstrate on your own car. Any Stabilator Distributor or Dealer will guarantee to refund your money if you want your Stabilators taken off. Write us for literature and name of the nearest Stabilator Dealer.

JOHN WARREN WATSON COMPANY
Twenty-fourth and Locust Streets
PHILADELPHIA




WATSON
STABILATORS



"Move on," says Monogram Cap to the curbstone thief—"there's nothing doing here."

You know car owners need this protection for the heat indicator. You know they don't want another key to bother with—and Monogram self-locks without any key. You know the selling power of convenience, such as Monogram Cap offers in the hinged lid and Instant Latch.

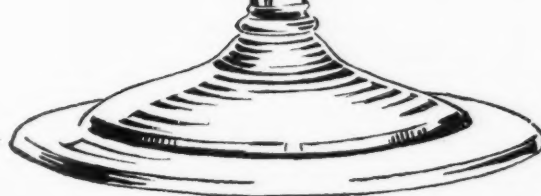
GENERAL AUTOMOTIVE CORP.,

Here is an item of extreme utility. It is undeniably ornamental on finest cars. It virtually demonstrates itself. It provides the strong *personal* appeal of Monogram initial shields—exclusive colors, too, for added profit.

Dealers know the satisfaction of pushing Monogram Caps. With a sales policy as fair as any ever known, Monogram is going extra strong.

600 W. Jackson Blvd., Chicago

MONOGRAM
Original Self Locking Radiator Cap



The BOSCH



**BOSCH
IGNITION
SYSTEM
FOR
FORDS**

**TYPE
600**

Insures quick, easy starts, clean plugs, added power. Has automatic spark advance—is waterproof. Prevents all ignition troubles. Price, \$12.75.



**BOSCH
SHOCK
ABSORBER**

"Smooths the Road"

A new, scientific device that controls car springs perfectly and provides true riding comfort at low cost. Prices per pair: For Fords \$10.00. Medium Cars \$15.00. Heavy Cars \$20.00.



**BOSCH
RED
SPARK
PLUGS**

The big sure firing, gas tight plug with the unbreakable insulator and the real nickel electrodes. Get the genuine—it's red! Regular sizes \$1.00. Ford size 75c.

Long Line

The Quality Windshield Wiper—

You can't afford to handle any but the best windshield wiper, no matter how liberal a discount others may give you—

Sell the Bosch Windshield Wiper and you can be absolutely sure of satisfaction among your customers. It's the highest quality, most up-to-date, efficient and dependable wiper available.

It operates electrically—doesn't depend on, or interfere with, the car engine.

It uses very little current but develops ample power—enough even to operate the Bosch Tandem Wiper as well, and give full vision to both front seat occupants.

Speed is always the same—doesn't hurry one minute and lag or stop the next.

And it is nationally advertised—every mail brings scores of inquiries from car owners and dealers.

You should be getting some of these sales, and a share of the profits. Wire our nearest branch for a sample, C. O. D. and start selling NOW.



It puts no burden on the battery—uses less than $1\frac{1}{4}$ amperes of current.

Price \$9.50

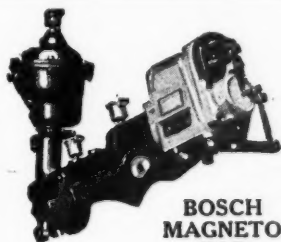
In Canada, \$14.25

DEALERS: Big advantages open to live dealers who can become Bosch Sales Agents and sell the Bosch Long Line of automotive necessities.

AMERICAN BOSCH MAGNETO CORPORATION

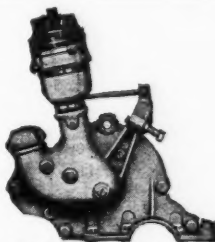
Main Office and Works: Springfield, Mass.

Branches: New York — Chicago — Detroit — San Francisco



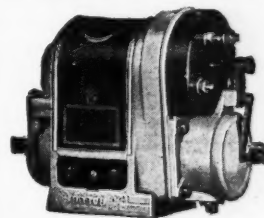
**BOSCH
MAGNETO
FOR
FORDSONS**

Provides Bosch High Tension Magneto Ignition for Fordsons. Eliminates coils and timer. Prevents all ignition troubles. Installed with, or without, the Bosch Throttle Governor. Prices on request.



**BOSCH DE LUXE
IGNITION SYSTEM
FOR FORDS
TYPE 513**

Includes the Bosch Coil, and Bosch Compensating Governor, which automatically advances and retards the spark to exactly meet the Ford engine's characteristics. Wonderfully efficient. Price \$25.00



**BOSCH
HIGH TENSION
MAGNETO**

The world's most dependable ignition system—over four million in use today—in demand everywhere for use on cars, trucks, tractors, motorcycles, motor boats and stationary engines. Prices on request.

AC SPARK PLUGS

A safe investment.

The best known, easiest selling and most profitable spark plugs.

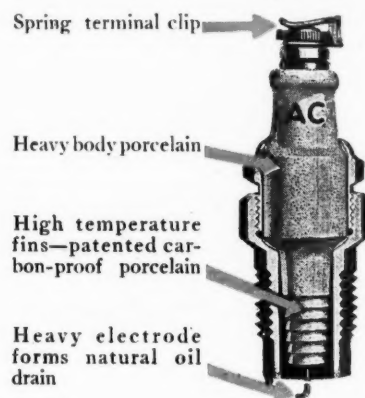
Backed up by the factory equipment business of more than 200 manufacturers.

Nationally advertised through magazines, newspapers, painted boards, store signs, window displays and direct advertising, which creates a big demand for them.

AC1075 SPARK PLUGS

*A good plug for
Fords*

The AC 1075 Spark Plug for Fords
is a big seller and money maker.



AC SPEEDOMETERS



The quality of AC Speedometers is proven by the fact that they are equipment on BUICK, CHEVROLET, CHRYSLER, GRAY, HAYNES, LEXINGTON, MAXWELL, OAKLAND and OLDSMOBILE.

THE MODEL FOR FORDS

Complete with all attachments. The new AC Direct Drive has done away with the swivel joint. Easily sold because of their high quality and national advertising.


SELL AC PRODUCTS—THEIR QUALITY AND
POPULARITY ASSURES DEMAND AND PROFIT

AC-SPHINX
Birmingham
ENGLAND

AC Spark Plug Company, FLINT, *Michigan*
Makers of AC Spark Plugs—AC Speedometers

U. S. Pat. No. 1,135,727, April 13, 1915; U. S. Pat. No. 1,216,139, Feb. 13, 1917. Other Patents Pending

AC-OLEO
Levallois-Perret
FRANCE



The NOBLE HEATER

Don't Wait!
**Jack Frost
 Makes 'em buy!**

BUT Don't wait for chilly weather to stock up on Noble Heaters. Get complete information and literature right NOW and start talking Driving Comfort to all your customers. You'll be surprised. Be prepared to give them immediate service and complete satisfaction---sell NOBLE HEATERS. With only four valve sizes carried in stock, you can fit ninety per cent of all cars. No need to tie up a lot of money in a variety of fittings. The Noble Heater is heat insulated and laboratory tests show that it has more than ninety-five per cent heat efficiency. Construction prevents gas escaping into car through heater. It gives HEAT---not gas. It is easy to install and pays you a nice profit. Don't Delay---Winter isn't far away.

Clip the coupon now and learn how we help you sell Noble Heaters and build up your Winter business.

Mail This Coupon Today!

Gladiator Manufacturing Co.,
 Indiana Avenue
 AUBURN, INDIANA

Gentlemen:
 Please send me full information and price of Noble Heaters. Also tell me about your new and complete Sales Plan.

Name

Town

State

*Why dealers
 make more money
 with the —*
NOBLE HEATER

- 1 Simple, compact and efficient.
- 2 Ninety-five per cent of motor heat radiated into car.
- 3 Odorless--construction absolutely leak-proof.
- 4 Noiseless operation.
Exhaust returns through muffler.
- 5 Simple, handy control--"on" and "off" floor button.
- 6 Fits 90 per cent of all makes of cars, with only four valve sizes.
- 7 Moderate in price, easy to install.
- 8 Pays a real profit.

GLADIATOR MFG. CO.

411 N. Indiana Ave.
 AUBURN, INDIANA





CARBON REMOVING BRUSH

Carbon Removing is now a Quick, Easy Job

WITH the Sioux Carbon Removing Brush you can do the job right—
peel off all carbon deposits easily, quickly, thoroughly.



Notice the construction — specially made stiff wires overlapping each other and making a double contact. This permits use of brush either in verticle position or tilted, so that you can get into the corners and do a real clean job. Made in two sizes—No. B66 with heavy wire for rough surfaces where carbon must be taken off by force—and No. B67 with fine wire for machined surfaces and for aluminum pistons where high polish is required. Set of two sizes, (No. B68.)

Used with small electric drills or Sioux Flexible Shaft.

Ask Your Jobber About Them

ALBERTSON & CO. Sioux City, Iowa.

SIOUX
Trade Mark Reg. U.S. Patent Office



The Best-Equipped Shop
Get the Business

The Indicator for 1925

Twice within six months General has been forced to announce that no new distributors could be taken. This gives some idea of the remarkable growth of business enjoyed by the General distributors this season. It was only by passing up all new business during March, April and May that we were enabled to make satisfactory deliveries to the established distributors. But after June 1st, when the new power house and other factory additions had been completed, we were again able to solicit more distributors.

Now, after a lapse of less than two months, we have again found it necessary to close the list against new business and confine our shipments to present distributors from August 15th to some time in October.

The steady growth of the business of these distributors is something that General has pointed to with pride year after year, but never has there been so complete a nationwide swing to General as is now evidenced by the pressing demand for tires and more tires by the General distributors in every section of the country.

This is the indicator of 1925 business for the General distributors. The demand will continue and gather momentum every month of 1925. This is assured in more than one way. Today its margin of leadership is greater than it has ever been before. But in addition to the standing of the product itself, the representation that is back of it in some 840 cities is of such strength and ability as to make the most of all advantages that are in the line.

The distributors of the General Tire are merchants in a real sense and they are tire engineers. Concentrating upon just one line, they have been able to study and understand their subject better than the average tire dealer. The extraordinary business they are doing, as reflected by the efforts of this factory to keep up with their requirements, is proof that the tire distributor's biggest opportunity lies in his giving undivided attention to this one line—becoming a specialist in the sale of General Cords.

We point to this proposition for tire distributors not as a matter of their favoring this factory, but solely on the basis of what the tire distributor can accomplish *for himself* by such a method. The General Company advocates exclusive representation among dealers in its line from the single standpoint that this is the certain road to a steadily growing business and a permanently established one for them.

Work has already begun on new plant additions costing a third of a million dollars, and with this healthy increase of production in view, we expect to open our list to new distributors about October 1st. We will limit this in order to assure adequate deliveries to all established accounts as well as new ones which will be taken. By so doing we can promise regular service beginning in October to those who will be in shape to work in a real way with the General line next spring. We will appreciate early correspondence from dealers who consider coming in with General later in the year.



The

GENERAL

BALLOON

REQUIRING SPECIAL WHEELS

BALLOON

TO FIT PRESENT WHEELS

REGULAR SIZE

LOW PRESSURE CORD

—goes a long way to make friends

BUILT IN AKRON, OHIO, BY THE GENERAL TIRE AND RUBBER CO.

Reinforced with ASBESTOS



Thermoid

TRANSMISSION LINING
for FORD CARS and TRUCKS

for Trucks and Heavy Duty

THE Ford owner and the trade for years have looked upon our Rexoid Transmission Lining as the last word in wear and dependability. Our latest achievement in the transmission lining field, "Thermoid," has all of Rexoid's dependability combined with an even greater resistance to wear.

As Thermoid comes from the looms it is half again as thick as the ordinary transmission lining and in addition is *made of reinforced asbestos*. It is then treated with a special compound to raise its resistance to oil and friction. Finally its extra fifty per cent. of material is brought to standard measure under tremendous heat and pressure.

Thermoid's extra weight and reinforced asbestos make it the longest wearing and most economical lining on the market. It is specially recommended for use on trucks and on passenger cars when continuous service or bad roads make "heavy duty" the order of the day.

THERMOID RUBBER COMPANY, Trenton, N. J.

New York, Chicago, Los Angeles, Detroit, Atlanta, Seattle, Kansas City,

Boston, San Francisco,

Cleveland, London,

Paris, Turin

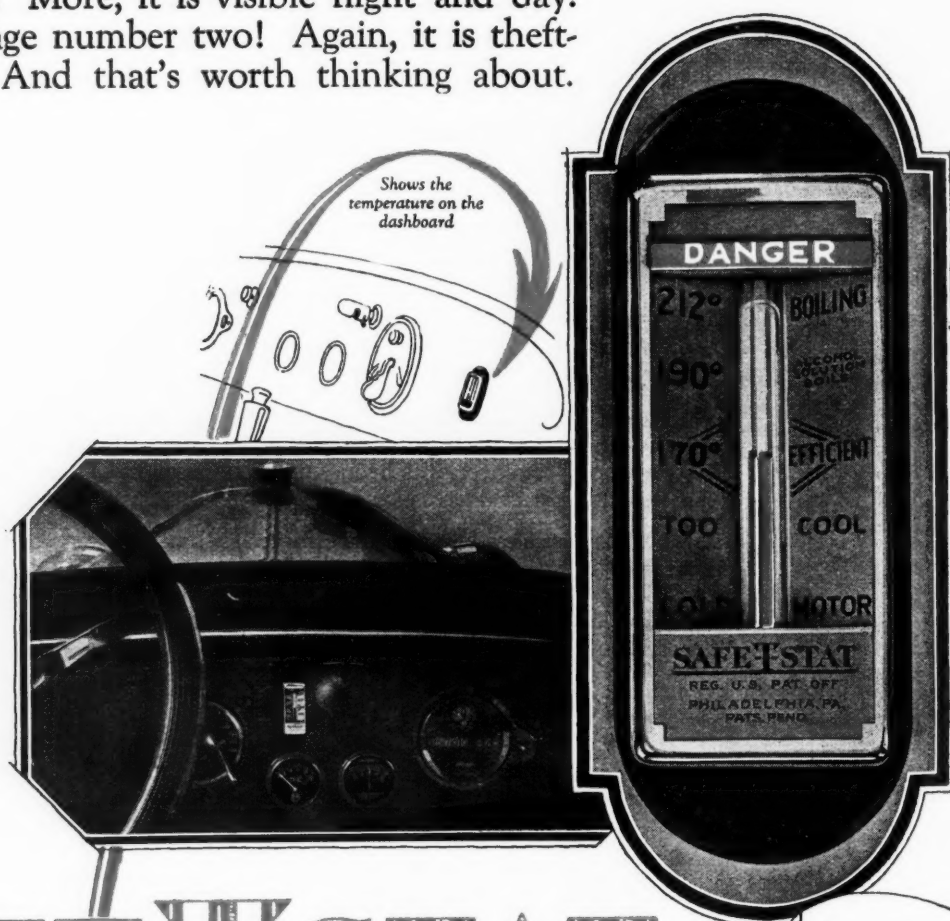
*Makers of Thermoid Brake
Lining, Thermoid Tires,
Thermoid-Hardy
Universal Joints*



ACCURATE!

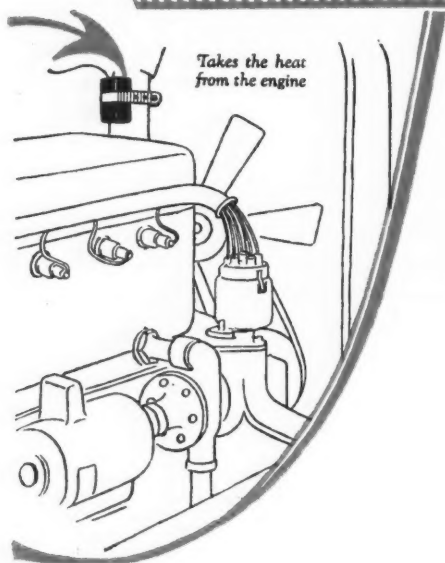
Yes! and it is *always* accurate, regardless of weather or radiator conditions. A big advantage! More, it is visible night and day. Advantage number two! Again, it is theft-proof. And that's worth thinking about.

A
Motor Heat
Indicator



SAFE-T-STAT

\$10.00



Motor Heat Indicator

is a handsome little instrument, mounted on the instrument board, and takes temperature direct from the engine. Instantly warns of overheating from any cause. Safe-T-Stat is electrically controlled and must not be confused with heat indicators actuated by vapor, or by fluid or gas pressure systems.

Simple in construction, Safe-T-Stat is quickly installed and operates indefinitely without adjustment or expense. No tapping of motor block.

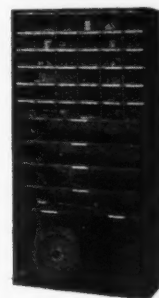
One model fits all cars—that means just one size to stock. Retail for \$10. Ask your jobber or write us direct.

The SAFE-T-STAT Co., Inc.
PHILADELPHIA

FACTORY
57th and Westminister Ave.

GENERAL OFFICES
Drexel Building

YOU BE THE JUDGE



LAPS SYSTEMS vs. Ordinary Shelving Units

- | | | |
|--|--|--|
| <ol style="list-style-type: none"> 1. Bins are built of size and shape to carry the car manufacturer's recommended parts quantities for various size dealer's stocks. 2. Parts are grouped by car assembly, with bins labeled numerically in each assembly. 3. Long parts are carried with the group to which they belong. 4. Saves floor space over wooden bins or ordinary shelving. No lost space, as bins are built to fit. 5. The correct bin size balances the stock, and gives visual inventory. 6. Bins can be expanded if desired. 7. Indexes and card records not necessary, due to bins being labeled numerically with parts numbers. 8. Changes in parts caused by changes in car models are readily handled, but seldom necessary, as cars in a like price class are assembled of parts of a similar size and shape. 9. LAPS is a well planned System. 10. Like a tailor-made suit, LAPS works best, looks best, and wears longest because it is made to fit. Has good display and good resale value. | | <ol style="list-style-type: none"> 1. Bins not built to suit shape or quantity of parts. Your stock man, instead of the car manufacturer, has to decide on quantities to carry. 2. No grouping of parts by assemblies. 3. No long parts carried. 4. Takes more floor space because bins do not fit. 5. Wrong bin sizes. Bins give no indication of proper stock. 6. Have to change from one bin to another to expand, and then change index. 7. Have to have a bin index record of the "hunt and find" type. 8. Changes in parts means more changes in bin placement, more changes in index record and more confusion. 9. No plan and no system. Just try your luck. 10. Like a "hand-me-down" suit, it never fits any condition exactly, has little display value and low resale value. |
|--|--|--|

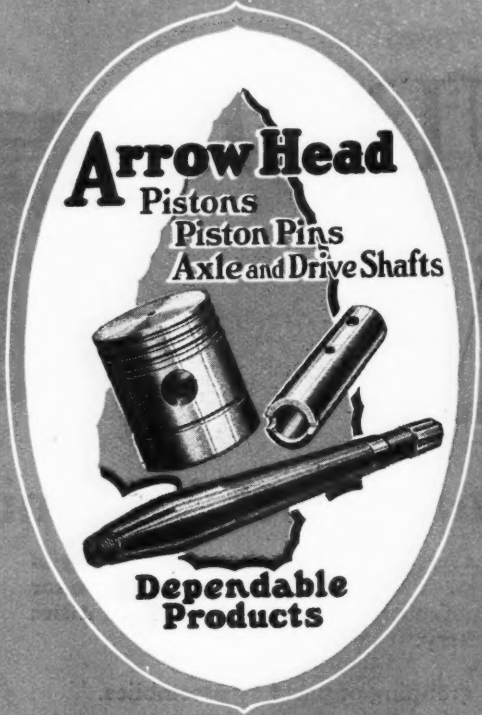
and you will decide in favor of SYSTEM

LAPS Systems are made only by

DAVID LUPTON'S SONS CO.

SALES OFFICE, 2631 Woodward Ave., DETROIT

Main Office & Factory, PHILADELPHIA



Arrow Head
Pistons
Piston Pins
Axle and Drive Shafts

**Dependable
Products**

ARROW HEAD STEEL PRODUCTS CO.
MINNEAPOLIS, MINNESOTA, U.S.A.

**DISTRIBUTORS AND
SAMPLE STOCKS IN ALL
IMPORTANT CENTERS**

Profits for Repair Men

Packed into three pages of this new book you will find our recommendations for installing pistons, fitting pins and replacing shafts. These brief suggestions are invaluable, because they represent years of scientific research and experience by this great organization.

The new booklet outlines 10 opportunities for motor repair men—also our recommendations for rebuilding motors—and complete list of Arrow Head Pistons, Pins and Shafts for cars, trucks, tractors, airplanes, etc. A valuable book—free on request.

ARROW HEAD STEEL PRODUCTS COMPANY
MINNEAPOLIS, MINNESOTA
U. S. A.

Opens and Shuts Itself!

37,100,000 messages on

Any Motor Will Run Better With A
PINES AUTOMATIC

WINTERFRONT

TRADE MARK REG. U.S. PAT. OFF.

Fall days are Winterfront days—profit days for you

We are doing our part by flooding the country with the Winterfront story—thirty-seven million messages in eight weeks, beginning Sept. 20th in the *Saturday Evening Post*. This means that each week 4½ million Winterfront advertisements will go into the homes of Winterfront prospects.

No matter where you sell, you can be sure that the bulk of the car owners will see our message either in *Post* or *Digest* or *Cosmopolitan* or *American*. We back this advertising with fine window displays and other advertising material. Write for details.

Good Profit on a good seller

At the 1924 reduced prices Winterfront will be an easier seller than ever. It gives you a good margin of profit with no installation or servicing expense. Attached in ten minutes by simply screwing up 4 long thin bolts that reach right through the radiator. The 1924 prices are as follows:

For cars with small radiators \$22.50. This includes Overland, Nash, Maxwell, Hupmobile, Studebaker Light Six, etc. For cars with medium size radiator the price is \$25.00. This size is called for on Ford, Dodge, Willys-Knight, Jordan, etc. For cars with large radiators the price is \$28.00. This size is used on Packard, Cadillac, Peerless, etc.

*Write for 1924 plans and the name
of distributor in your territory*

PINES WINTERFRONT COMPANY

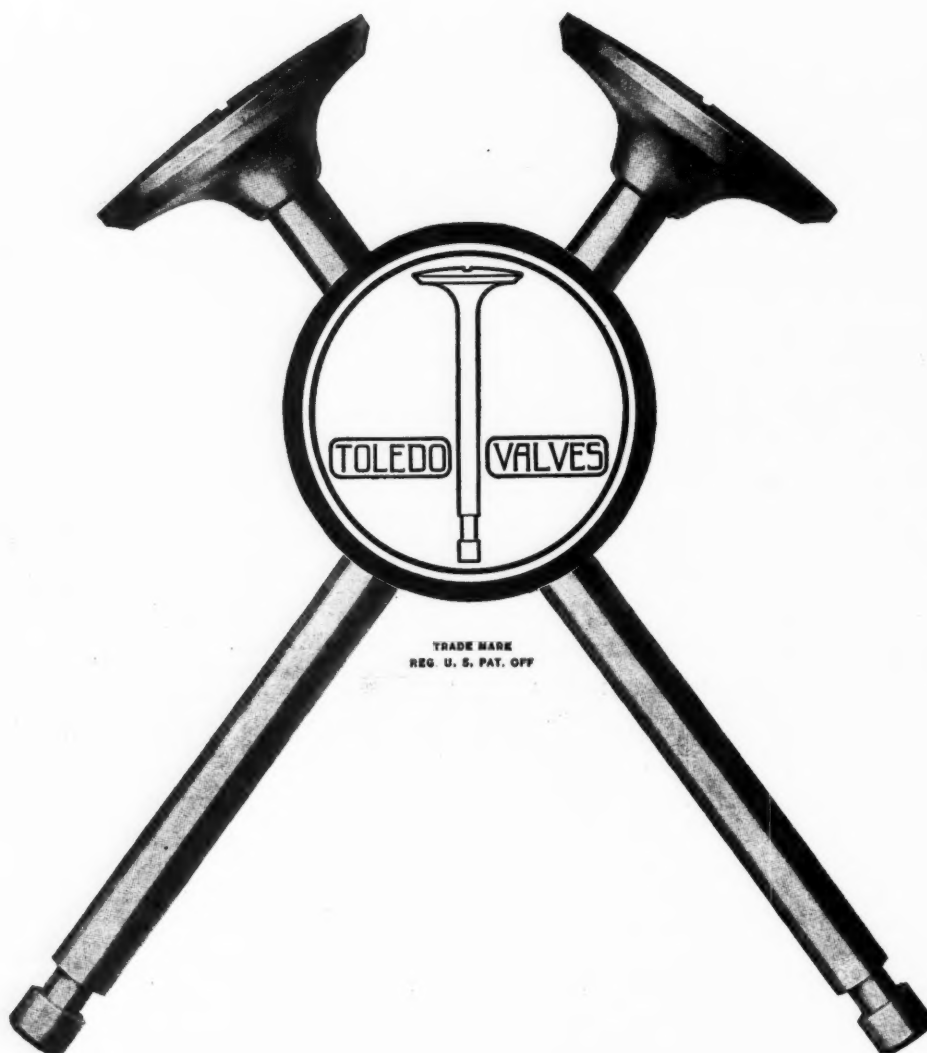
412 North Sacramento Boulevard

Chicago, Illinois

**Get Your Profit
on this
good seller**

PINES WINTERFRONT CO.
412 N. Sacramento Blvd., Chicago, Ill.
Gentlemen: Please send us full details on 1924 sales plan as
advertised in Motor Age.
Name
Signed by
Street Car we handle
City State

Now



A TOLEDO Valve represents the perfect expression of a sound engineering principle, at a price that permits universal application. The immense popularity of Toledo Valves with automotive builder, service man, and car owner is built squarely upon the stability of the product. Toledo Valves are made by exclusive processes which bring exclusive advantages to the car owner. They are sold in a fashion that brings exclusive advantages to the dealer.

THE TOLEDO STEEL PRODUCTS CO.
TOLEDO • OHIO

MANUFACTURERS OF VALVES EXCLUSIVELY FOR OVER TEN YEARS

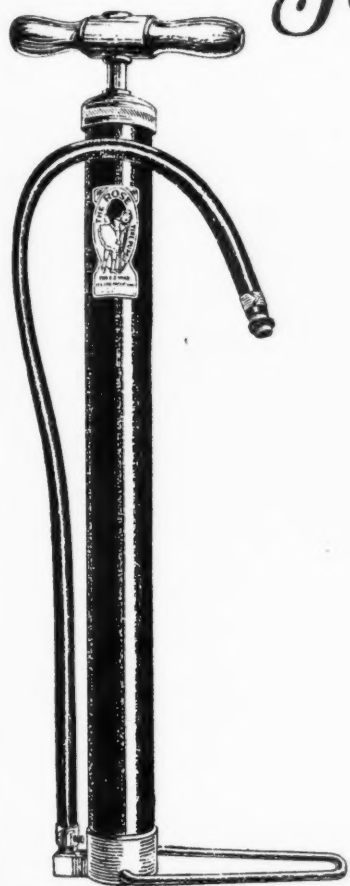


ROSE Tire Pump Equipment *for 'Round the World Fliers!*

Again America has placed its stamp of approval on the Rose Tire Pump by including it as equipment for our 'Round-the-World Fliers.

In such a venture even the smallest details must be planned for success. Dependability is paramount. The choice of Rose Tire Pumps, for years America's leader, was obvious.

Dependable service and easy pumping is what your customers expect of the tire pump you sell them. In no other pump can these advantages be found in greater degree. Your jobber has them.



FRANK ROSE MFG. CO., HASTINGS, NEBR.

1 Town—9600 Population
1 Dealer—a Live One
6 Months—Profitable Ones
175 Tuthill Springs—None Better

What this dealer did others are doing
and you can do the same. Ask your
jobber or write us direct.

TITANIC SPRINGS

Alloy Steel Throughout



TUTHILL SPRING COMPANY

Est. 1880

760 Polk St., Chicago, Ill.

Show Fisk Balloon Tires In Your Window

Display Balloon Tire Advertising

BE among the leaders who help to develop the use of balloon tires. Motorists are willing to pay a reasonable price when they are ready to consider this new equipment.

Dealers who have featured balloon tires have sold them in quantities and without a sacrifice of legitimate profit.

The display of these tires will bring interested tire owners into your store and every man who drives is a prospect for a tire of one kind or another. It is good business to use every effort which brings about a point of contact with those who make your market.

Balloon tires are distributed through 140 Fisk branches, making it possible for unusually easy and quick delivery to dealers everywhere.

The Fisk Tire Company, Inc.

Chicopee Falls, Mass.



New and Finer Riding Comfort

Gabriel is the only spring control device officially, by patent and copyright, entitled to the name *Snubber*. To make certain that you have genuine Gabriel Snubbers installed on your car, go to the authorized Gabriel Snubber Sales and Service Stations which are maintained in 2200 cities and towns. Motor car dealers who are desirous of assuring their customers of greatest satisfaction recommend Gabriel Snubbers and many install them as well.

The new Gabriel Balloon-Type Snubbers are entirely new in principle—designed primarily for balloon and low-pressure tires.

They are enjoying remarkable sales, in response to the great Gabriel advertising campaign which is selling to motorists the necessity for equipping with these new Gabriels at the same time they equip with balloon or low-pressure tires.

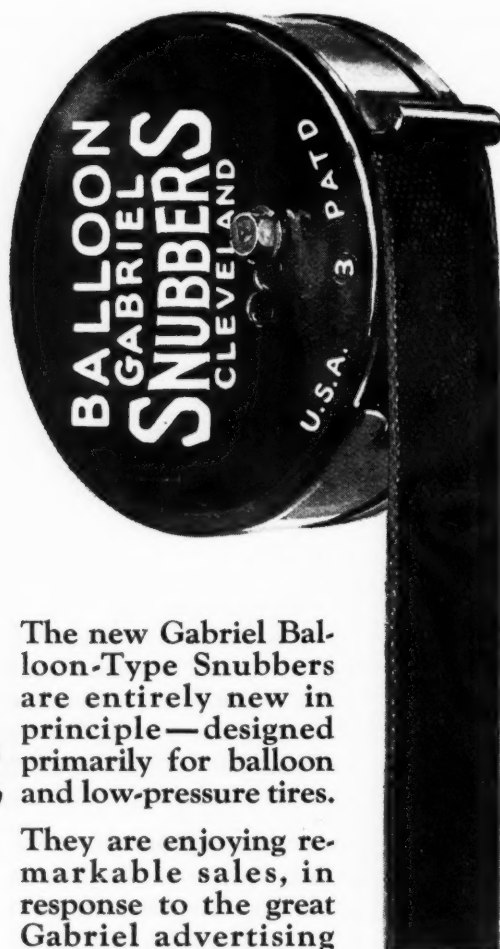
The new Gabriel Balloon-Type Snubbers have the free play which is absolutely necessary to permit the tires to function on such roads.

On rough roads, the need

for these new Gabriel Balloon-Type Snubbers is particularly plain—due to the galloping, pitching or rolling motion caused by the greater upthrow of the low-pressure tires.

Here again a new and exclusive feature of these balloon-type Gabriels is especially important—for they have the increased braking action which instantly stops all rolling, galloping or pitching.

The advertising, the merit of the product, and the new Gabriel sales proposition combine to make it especially profitable for you to stock and sell Gabriels now.



New
Balloon
Type

Gabriel Snubbers

GABRIEL MANUFACTURING COMPANY

1415 East 40th Street - Cleveland, Ohio

Gabriel Manufacturing Company of Canada, Toronto, Ont.

~ Sales & Service Everywhere ~

RISING MARKETS PAY

Every experienced automobile dealer has observed the profits that accrue to dealers in cars whose market is being largely expanded.

Such an opportunity is at hand in the STAR franchise. 200,000 Stars marketed in the first two years of production is a RECORD, yet only a foundation for the bigger, broader establishment of the Star now under way.

We want to hear from live merchandisers in all territory in which the Star car is not adequately represented.

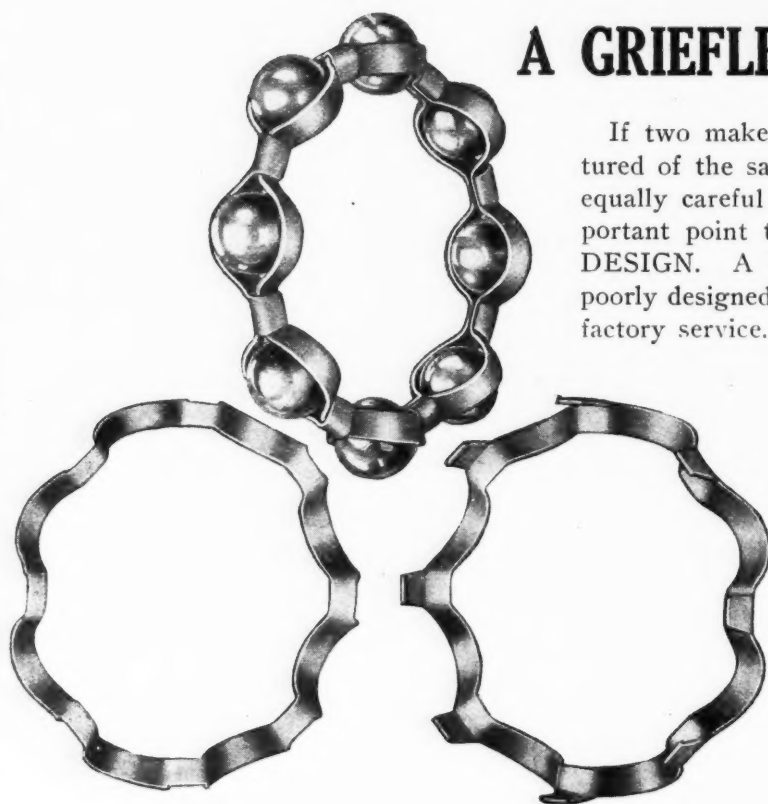
Are you interested?

DURANT MOTORS - INC -
Fisk Building
57th Street and Broadway
New York, N. Y.

Colin Campbell
Vice-President

FAFNIR

A GRIEFLESS RETAINER



If two makes of bearings are manufactured of the same grade of steel and with equally careful workmanship, then the important point to the user is RETAINER DESIGN. A well made bearing with a poorly designed retainer will not give satisfactory service.

This FAFNIR PATENTED RETAINER is used in Single Row Bearings both with and without filling notches and in Double Row types wherever possible. Its advantages are evident.

There are NO rivets or screws to work loose or break.

The flexible fingers cross ABOVE the pitch line of the balls which are held on their axes of rotation without friction.

Bearing CAPACITY is increased by the use of larger balls.

When you buy Ball Bearings you are really buying lasting ball bearing service, so specify FAFNIR the bearings with the "GRIEFLESS" RETAINER.

We have a limited amount of territory still open and we will be glad to submit a distributors' proposition upon request.

THE FAFNIR BEARING COMPANY

New Britain, Conn.

CHICAGO, ILL. 2131 South Michigan Ave.

DETROIT, MICH. 120 Madison Ave. Rm. 511

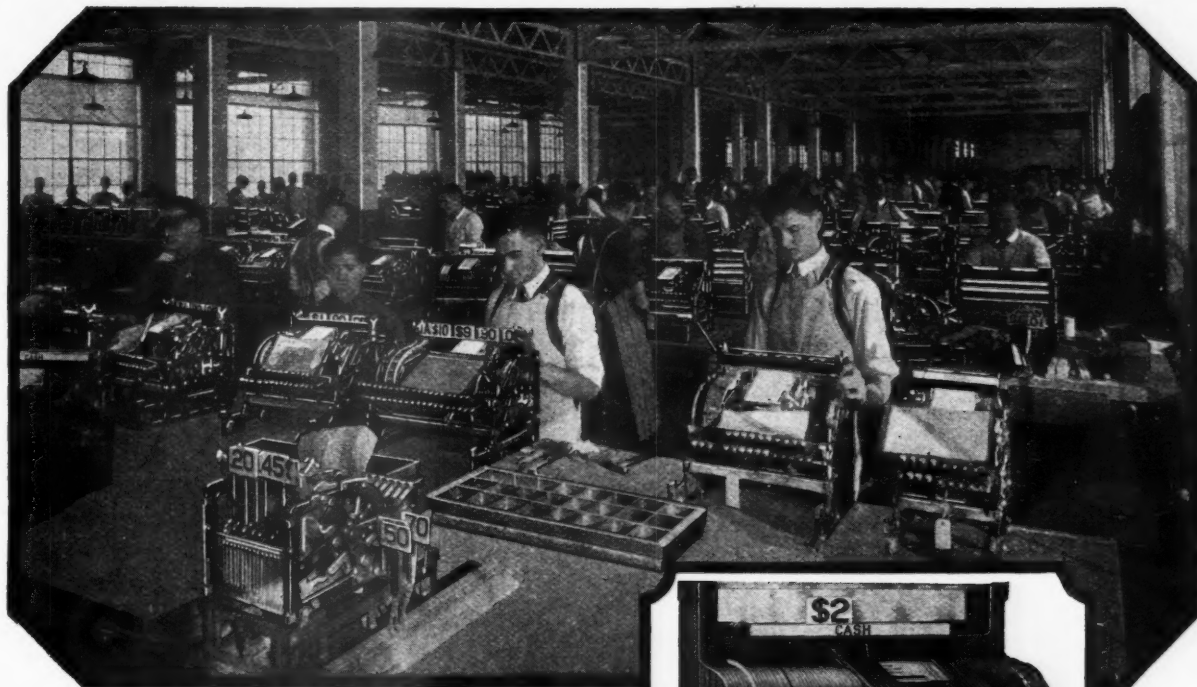
CLEVELAND, OHIO, 1016-1017 Sweetland Bldg.

NEW YORK, N. Y. 5 Columbus Circle

NEWARK, N. J. 271 Central Ave.

PHILADELPHIA, Pa. 1427 Fairmont Ave.

Just an Assembly Department in the *Remington* Cash Register Factory



IN this busy assembly department highly skilled Remington cash register experts build Remington Cash Registers of hundreds of accurately manufactured parts.

Merchants in every type of business all over the country can testify to the quality of the work they do.

The Remington is the *new and better* Cash Register. You ought to see it.

Akron, Ohio
Albany, N. Y.
Atlanta, Ga.
Baltimore, Md.
Binghamton, N. Y.
Birmingham, Ala.
Boston, Mass.
Bridgeport, Conn.
Brooklyn, N. Y.
Buffalo, N. Y.
Charlotte, N. C.
Chicago, Ill.
Cincinnati, Ohio
Cleveland, Ohio
Columbus, Ohio
Dallas, Tex.
Davenport, Ia.
Denver, Colo.
Des Moines, Ia.
Detroit, Mich.
E. St. Louis, Ill.

REMINGTON CASH REGISTER CO., Inc.

Factory and General Sales Office, Ilion, N. Y.

Subsidiary of REMINGTON ARMS COMPANY, Inc.

Makers of Remington Firearms, Ammunition and Cutlery

In Canada: Remington Cash Register Company of Canada, Ltd.

557 Yonge Street, Toronto, Ont., Canada

Fargo, N. D.
Fort Worth, Tex.
Fresno, Calif.
Grand Rapids, Mich.
Harrisburg, Pa.
Hartford, Conn.
Houston, Tex.
Indianapolis, Ind.
Jacksonville, Fla.
Jersey City, N. J.
Kansas City, Mo.
Lansing, Mich.
Little Rock, Ark.
Los Angeles, Calif.

Louisville, Ky.
Madison, Wis.
Memphis, Tenn.
Miami, Fla.
Milwaukee, Wis.
Minneapolis, Minn.
Nashville, Tenn.
Newark, N. J.
New Haven, Conn.
New Orleans, La.
New York City
Oakland Calif.
Oklahoma City, Okla.
Omaha, Nebr.

Philadelphia, Pa.
Pittsburgh, Pa.
Portland, Me.
Portland, Ore.
Providence, R. I.
Reading, Pa.
Rochester, N. Y.
Sacramento, Calif.
Salt Lake City, Utah
San Antonio, Tex.
San Diego, Calif.
San Francisco, Calif.
Scranton, Pa.
Seattle, Wash.

Sioux City, Ia.
Spokane, Wash.
Springfield, Mass.
Springfield, Ohio
St. Louis, Mo.
St. Paul, Minn.
Syracuse, N. Y.
Tacoma, Wash.
Tampa, Fla.
Toledo, Ohio
Toronto, Ont.
Trenton, N. J.
Utica, N. Y.
Vancouver, B. C.
Washington, D. C.
Wheeling, W. Va.
Wichita, Kan.
Wilkes-Barre, Pa.
Wilmington, Del.
Yonkers, N. Y.
Youngstown, Ohio

There is a Remington Cash Register built to fit your business. Get in touch with the Office nearest to you, and you will find our representative there willing and glad to make a complete demonstration.

BEARING SCRAPER

No. **382**

Price 90 cents



Bearing Scrapers shaped for smooth cutting

HERE is a bearing scraper with a razor-like edge—and with just the right taper and curve for smooth, even, comfortable cutting.

Note the recess in this scraper—an exclusive Goodell-Pratt feature. That's to give a narrow, keen cutting edge—an edge that can be easily resharpened by a few strokes on an oilstone.

Blade is forged from a very high grade of steel carefully hardened and tempered. Polished shank. Mahogany finished handle.

Goodell-Pratt Bearing Scrapers are made in four sizes—with a cutting edge of $1\frac{1}{2}$, $2\frac{1}{2}$, $3\frac{1}{2}$ and $4\frac{1}{2}$ inches.

Other Tools for Motor Work

The Goodell-Pratt family of 1500 Good Tools includes many other tools of special interest to garages, service stations, accessory dealers, and motorists. Write for Catalog No. 15. It shows them all. And it's free.

GOODELL-PRATT COMPANY, Greenfield, Mass., U. S. A.

Toolsmiths

Makers of Mr. Punch

GOODELL-PRATT

1500 GOOD TOOLS



EMPIRE BOLTS NUTS



An Empire cold punched nut is good on any bolt, and an Empire New Process bolt is good on any nut. *But they are best when used together.* Here is gauge-like fit-flawless mating of threads *that just about doubles* the workman's output.

RUSSELL, BURDSALL & WARD
⊗ **BOLT & NUT COMPANY** ⊗

PORT CHESTER, N.Y.

PEMBERWICK, CONN.

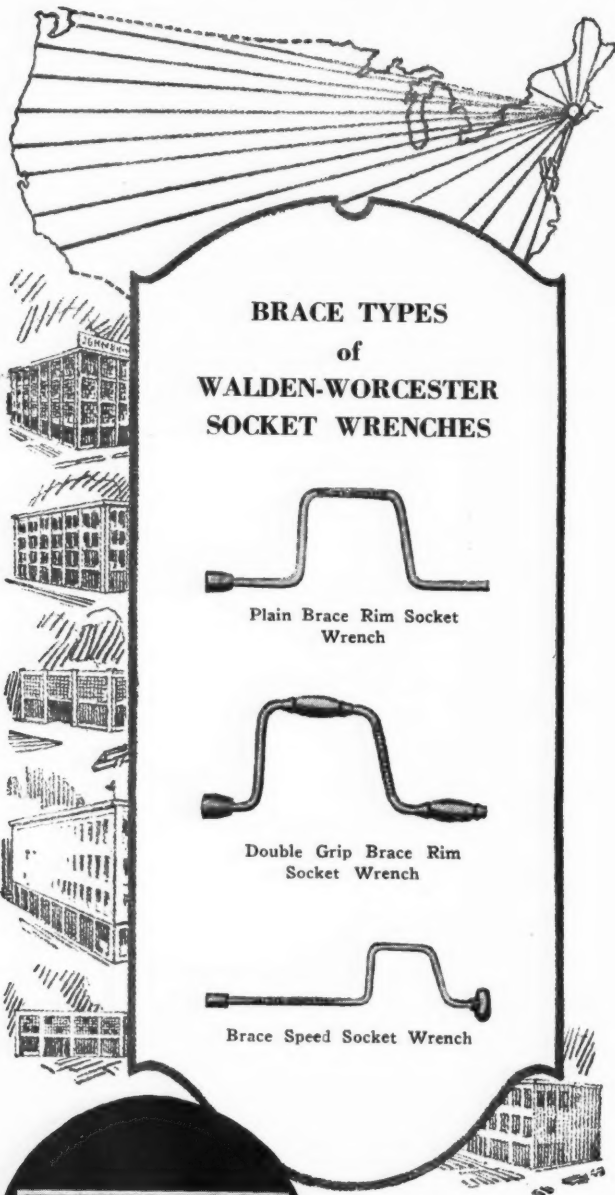
CHICAGO

SAN FRANCISCO

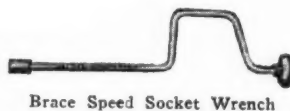
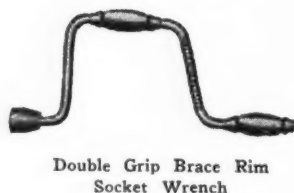
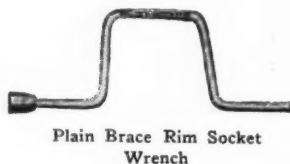
ROCK FALLS, ILL.

Makers of Bolts, Nuts and Rivets Since 1845

Nation-wide distribution !



BRACE TYPES of WALDEN-WORCESTER SOCKET WRENCHES



Just around the corner, everywhere, there's a Walden-Worcester Jobber—buy from him.

The fifth of a series of advertisements giving reasons why it pays to be a Walden-Worcester Dealer.

As a Walden-Worcester Dealer, the fact that jobbers everywhere carry a complete line of Walden-Worcester Socket Wrenches, means economy of purchase thru close source of supply. You can replenish your Walden-Worcester Socket Wrench Stock quickly, should sudden inventory reveal a shortage of certain types or sizes. This means a Walden-Worcester Dealer can get all of the Socket Wrench business that comes his way—no lost sales thru having to wait several days for stock being shipped from some distant jobber.

Just around the corner everywhere, there's a Walden-Worcester Jobber—buy from him.

WALDEN-WORCESTER

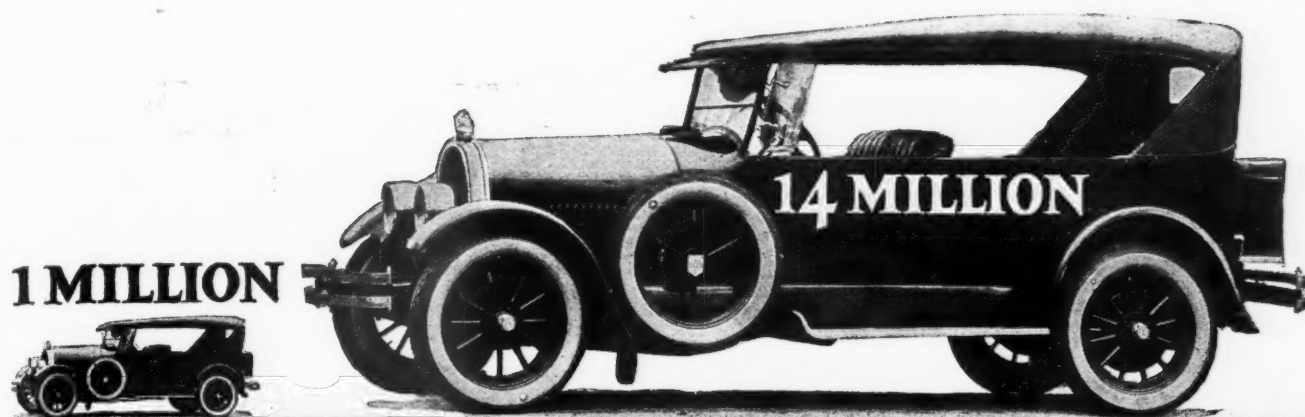
INCORPORATED

GENERAL OFFICES AND FACTORY
WORCESTER, MASS.

The trade knows

WALDEN-WORCESTER

The original, and largest manufacturers of Wire Handle Socket Wrenches, in the World



YOUR MARKET!

There are over 1 million Folberth Automatic Windshield Cleaners now in service. But there is still a big percentage of 14 million motorists who sooner or later will buy Folberths. This is **YOUR MARKET**.

Every day increasing numbers of automobile owners are realizing the importance of clear vision in wet weather. 39 automobile manufacturers recognized it by adopting the Folberth as standard equipment. Over a hundred thousand automotive merchants recognized the inevitable demand by *selling* Folberths. When are *you* going to start in this rapidly growing business? Your market is waiting for you. *Go after it.*

Ask your jobber to supply you with Folberth "Universal" and "Junior" models, the new "Parts-Kit," and the numerous Sales Helps prepared especially for you.

THE FOLBERTH AUTO SPECIALTY CO., CLEVELAND, OHIO

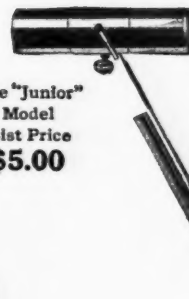
FOLBERTH *Automatic* WINDSHIELD CLEANER



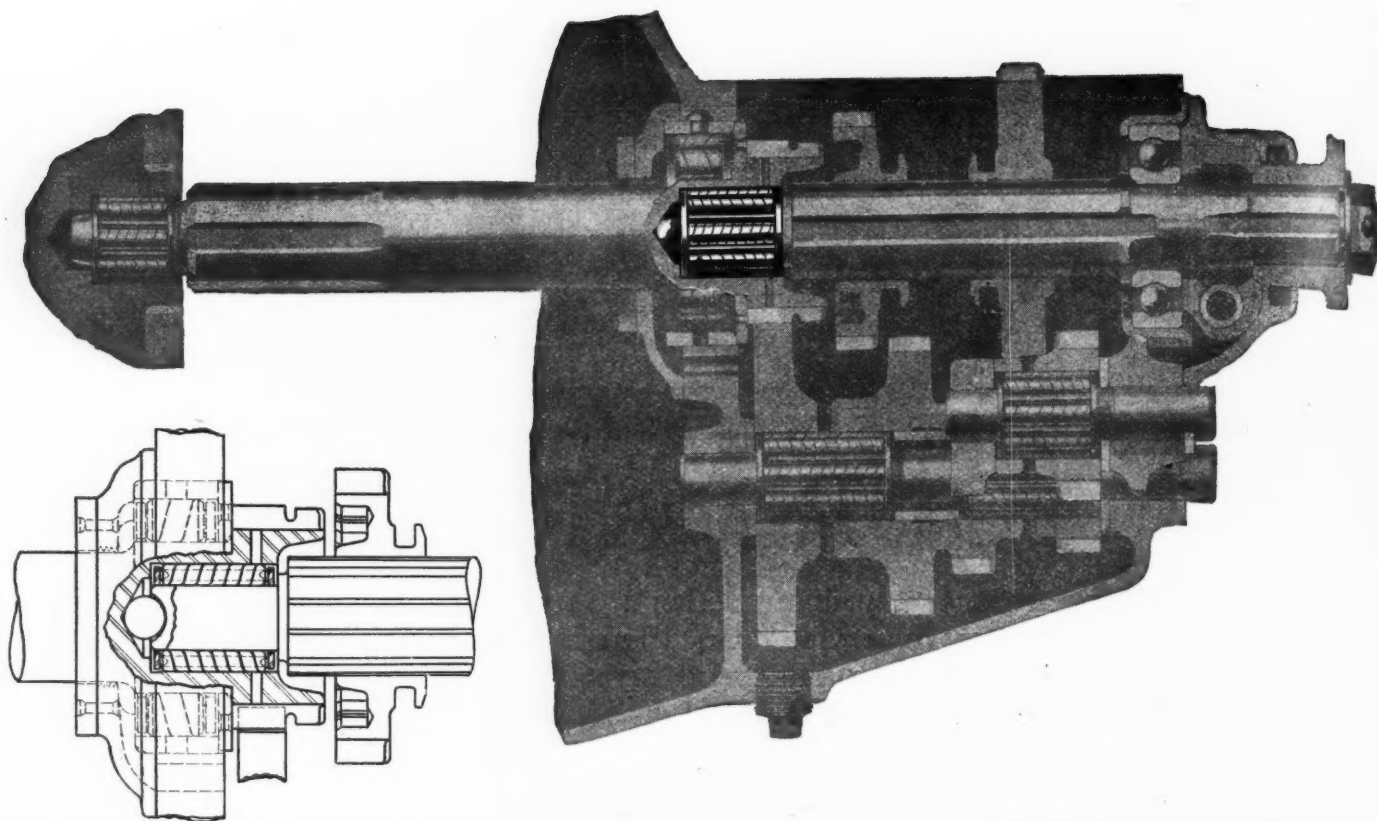
The "Universal"
Model
List Price
\$7.00



The "Parts-Kit"
List Price
\$11.25



The "Junior"
Model
List Price
\$5.00



Higher Quality Transmissions at Low Cost

No. 2 *In the Pocket Position*

Hyatt bearings, with their durability and lubrication advantages, are ideal for the pocket position. Their use insures higher quality transmissions that will eliminate costly service charges.

Plain pocket bushings wear rapidly, rattle and have to be replaced. Hyatt bearings save this expense for their wear is negligible and they seldom, if ever, need to be replaced.

In renewing a plain pocket bushing, it is very essential that it be accurately reamed to size to receive the end of the main shaft. This is a difficult operation and few garages are equipped to do it. It must be carefully and skillfully done or wear and noise will develop rapidly. In the few cases where Hyatt bearings have to be renewed the installation is extremely simple.

The pocket position in a transmission is, of course, hard to lubricate at best. In cold weather, when the oil is stiff, plain bushings are often scored before the lubricant can begin to circulate. This causes premature wear, looseness and noise. Hyatt bearings, on the other hand, can operate temporarily without lubricant and be in no danger of wearing. They will continue to run just as quietly and efficiently after operating under such adverse conditions as they did before.

Hyatt bearings are carefree bearings. In the pocket position of a transmission they need no attention, but will continue to function quietly and with lasting satisfaction for years. Install them for dependable, quiet transmission performance.

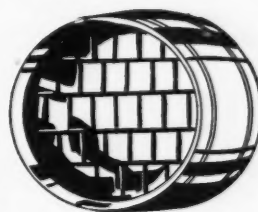
HYATT ROLLER BEARING COMPANY

NEWARK DETROIT CHICAGO SAN FRANCISCO

MILWAUKEE WORCESTER CLEVELAND PITTSBURGH PHILADELPHIA

HYATT
Quiet
Roller Bearings

Helps you sell!



The Lorentzen Headlight Kontrol eliminates the dangerous dimming switch. Fits on the steering column. Regulates the headlights at a touch of the fingers without removing hands from wheel, foot from pedal or eyes from road. Brings the lights down gradually through 7 stages of light that blend into each other, giving perfect vision without strain or effort.

Retails at \$7.50. Installed in 10 minutes. Mail coupon for full details.



**Clip and mail
this Coupon
TODAY—
NOW**

Lorentzen Headlight Kontrol, Inc.
60 Grand St., New York.
Please tell me how I can get a Lorentzen Counter
Demonstrator FREE. I sell accessories.

Name Address

Get this money-maker for your accessory counter

Increase your accessory profits with this Lorentzen Tester. Show them how your accessories work. This kind of demonstration clinches the sale. Use it as a free service for testing spark plugs, bulbs, etc. Gets them into your store. Brings repeat business. Builds good will.

A real attention-getter on

your counter. Nicely finished to harmonize with the finest fixtures. Mahogany color. Substantially built. Complete with terminals, switches and lamp sockets. This expensive outfit given FREE with initial order of Lorentzen Kontrols. Get on our list. Fill in and mail coupon NOW!

LORENTZEN HEADLIGHT KONTROL, INC.
60 Grand St., New York

Foreign Distributors

European Office:
Lorentzen Headlight Kontrol,
Raadhedspladsen 45,
Copenhagen B, Denmark.

Canadian Distributors:
Beaver Auto Necessities, Limited,
21 St. Nicholas Street,
Montreal, Canada.

Australia and New Zealand
Distributors:
Nolan-Smith & Company, Ltd.
109 Broad Street, N. Y. City.
16 Carrington St., Sydney,
N. S. W., Australia.
104 Manchester St.,
Christchurch, New Zealand.

Copyright, 1924, by Lorentzen Headlight Kontrol, Inc.

Have you noticed how many fine cars carry them?

OWNERS of the higher priced cars have shown a decided preference for this double-rail Eaton model.

The beauty of this bumper is the beauty of simplicity. There is no bar or clamp, nothing save the unassuming but attractive medallion in the center, to break the smooth, graceful contour of the rails.

Wide impact surface and double loop spring construction give this bumper exceptional strength and resiliency. It has stood the test of time and is now more popular than ever.

Made in different weights, for medium and heavy cars, and reasonably priced. Ask your jobber or write us.

EATON

BUMPERS

THE EATON AXLE & SPRING COMPANY
CLEVELAND

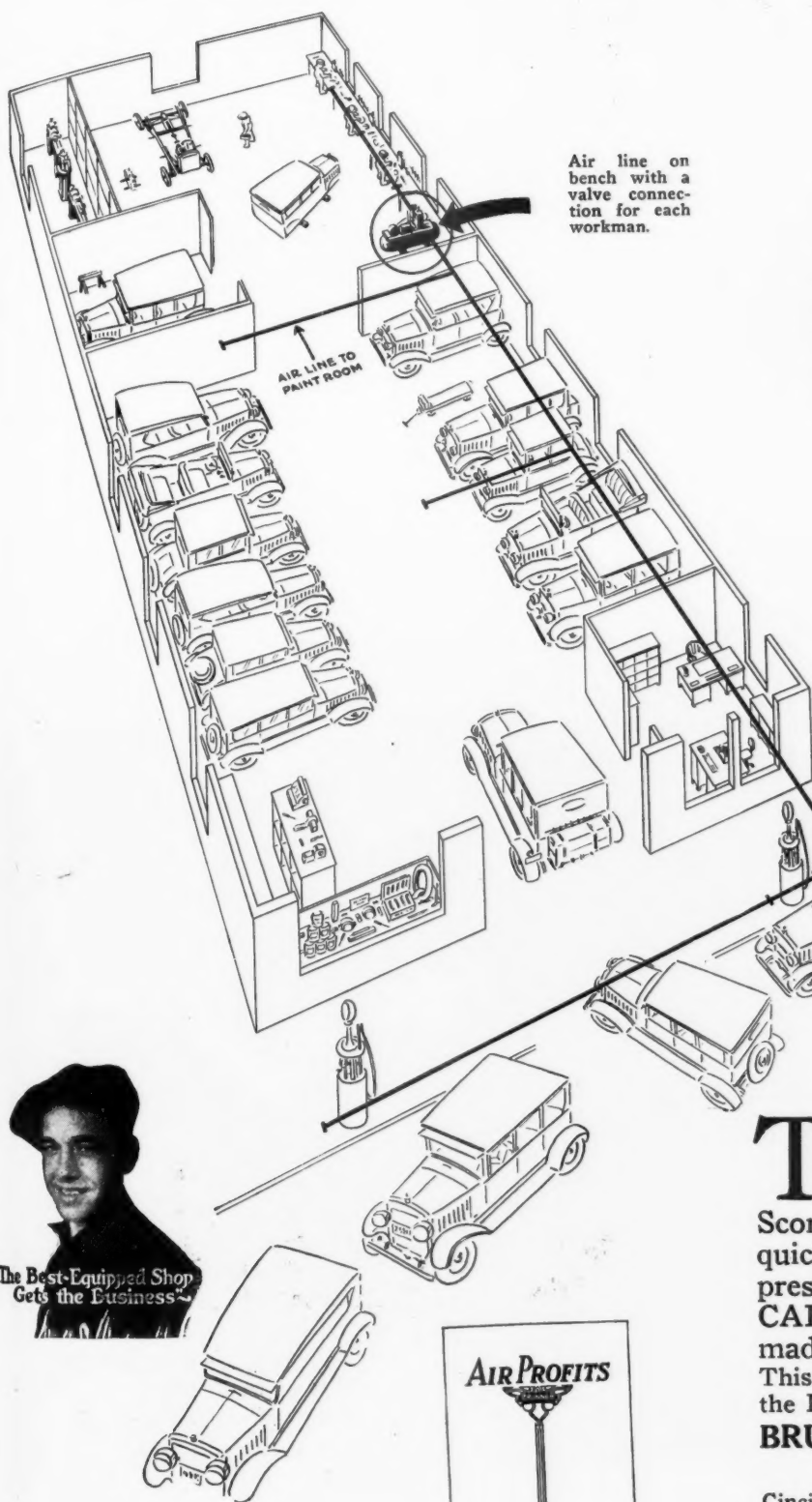
NEW YORK
616 W. 56th St.
CHICAGO
2933 Calumet Ave.

BOSTON
162 Brookline Ave.
ALBANY
No. Pearl and Van Woert

PHILADELPHIA
223 N. 22nd St.
CLEVELAND
6515 Carnegie Ave.



USE AIR POWER!



BRUNNER Model 967

Heavy duty assembled unit. Operates as smoothly and silently as an eight cylinder motor. Absolutely no vibration to loosen joints and cause trouble—it is fully capable of serving the "free air" needs of a sizable Service Station as well as providing air power for the shop.

Air Line to curb for Free Air Service

THE possibilities of profit through the use of air power in the shop are very great.

Scores of jobs can be handled more quickly and economically with compressed air than in any other way—and CAR REPAINTING alone can be made a paying business.

This thing is worth looking into. Write for the Brunner Booklet "AIR PROFITS."

BRUNNER MFG. CO., UTICA, N. Y.

Oldest and Largest Builders of Garage Air Compressors in the World

Cincinnati, O. Kansas City, Mo. San Francisco
Export Office—Utica, N. Y.

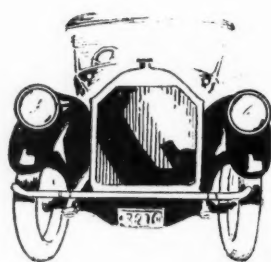
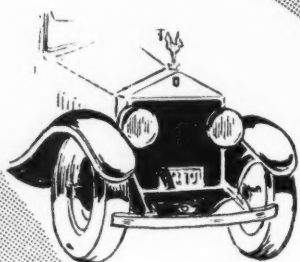
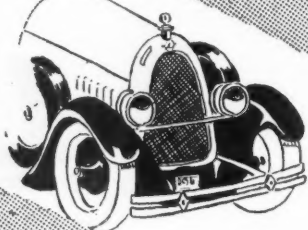


The Best-Equipped Shop Gets the Business

AIR PROFITS



Write for this Book

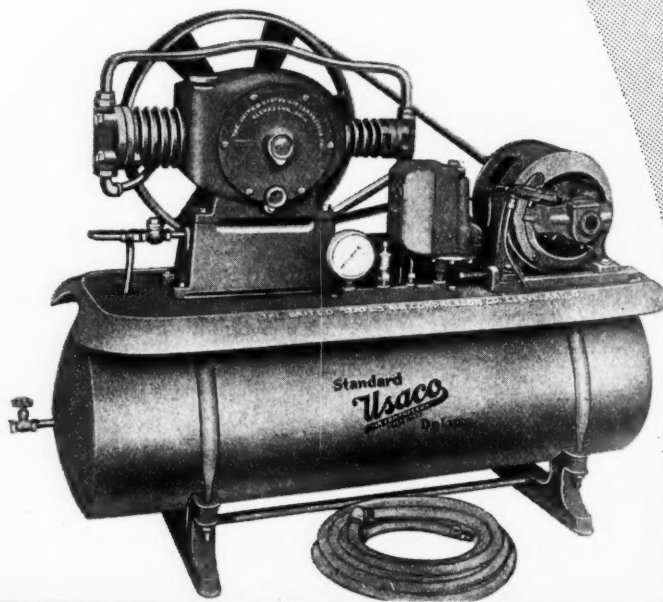


**Built and runs
like a high grade
motor car for ~
years and years**

The U. S. *Patented*
Pressure Release not
only protects the mo-
tor but *automatically*
discharges all moist-
ure and condensation
instead of pumping it
into the tank, assur-
ing clean dry air for
all tires.

If the pressure release
is on the *motor* it's a
Usaco.

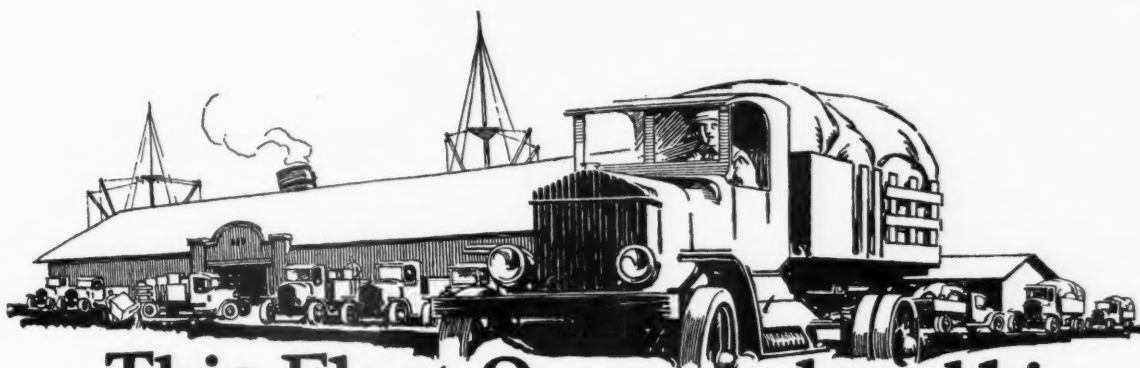
The United States
Air Compressor Co.
5304 Harvard Ave.
Cleveland, Ohio



U.S.

U.S. Air Compressors
Usaco
TRADE MARK

SELL THE ONLY OIL RING WITH A MILEAGE GUARANTEE



**This Fleet Owner reduced his
oil consumption from
3 drums in 30 days to
1 drum in 40 days!**



"Until I equipped my fleet of fourteen large trucks with Sav-Oil Piston Rings they consumed three drums of oil a month. *It took just one truck with Sav-Oil Rings to prove their merit.*

Nine Kleibers, three Fageols, and two Packards comprise my fleet, *now 100 per cent Sav-Oil and using one drum of oil in forty days.*

Apart from the economy in oil, there is an absence of other troubles, with which our Motors had been afflicted, with an all around marked improvement in our service, which can only be attributed to Sav-Oil Rings."

(Name on request)

Sav-Oil Rings will accomplish these results for truck owners in your territory. See them. An installation will win their everlasting good will and continued patronage.

Order from your nearest distributor.

Territories Open for Distributors

The Sav-Oil Ring Mfg. Co.

1037 So. Figueroa St.

Los Angeles

Sav-Oil Piston Ring Co.
2056 Jackson Blvd.
Chicago, Illinois

Sav-Oil Ring Mfg. Co.
550 Golden Gate Ave.
San Francisco, Cal.

Mountjoy Bros.
733 W. Colfax
Denver, Colo.

H. C. Alexander
612 W. Seventh St.
Little Rock, Ark.

H. W. Blevins
1532 Grand Ave.
Kansas City, Mo.

C. H. Mountjoy & Co.
211 Third Street
San Antonio, Texas

Why the Price of the New Milwaukee was Not Raised

WHEN the Bakelite-cased Milwaukee Timer was announced, many were surprised that the price was not increased. If Milwaukee's production had been only four or five hundred thousand timers a year, the price would have been higher. But greatly increased sales and production absorb the extra cost of the new Milwaukee. That's why it still sells for \$2.00.

Here, in a few words, is why Milwaukee is making new sales records for dealers: Ford-type (roller) timer—"short-proof", trouble-free, more durable Bakelite case—nationally advertised for years—lowest-priced Bakelite-cased ignition unit on the market.

It's your own fault if you are not making real money on timers. Your jobber has Milwaukee.

MILWAUKEE MOTOR PRODUCTS, Inc.
MILWAUKEE, WISCONSIN

New Milwaukee Features

Bone-hard fiber race pressed to a tight fit in the Bakelite case. Remains satin-smooth for thousands of miles.

Only Bakelite case on a Ford-type timer. Makes the Milwaukee absolutely "short-proof". Puts it in a class with high-priced ignition units.

Fine steel contact points with welded stems. Locked in position. Extra thick throughout for longest life.

Famous Milwaukee Timer brush assembly. Two bronze castings, fitted and gauged for accurate alignment. Hardened steel roller, finished like a ball bearing.

MILWAUKEE TIMER for FORDS

(BAKELITE CASE)

Display Cut-out—Free!

Three-color Window and Counter display. Holds a Milwaukee Timer from stock. New process—oil colors, extra brilliant, washable. Sent free, postpaid. Write us direct.

No increase in price.
Sells FAST at

\$2.00

(\$2.75 in Canada)

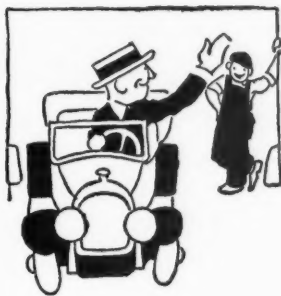


Sell 'em-

that New Car Thrill- It means more profits



There are a whole lot of car owners dragging around with worn, sluggish motors who are just ripe for a sales talk on motor re-conditioning.



They'll listen and act when you tell them you can restore the old motor's original pep and power with a re-conditioning job and McQuay-Norris parts.



With the new low prices on McQuay-Norris Leak-Proof and Superoyl rings you can make a price that's right and collect real profits.

That new car thrill appeals to them all. Sell 'em.

McQUAY-NORRIS

PISTON RINGS - PISTONS - PINS - BEARINGS

Remember

The best profits are in the best parts. Poor replacement parts can ruin a good mechanical job.

Cooper Dash Control

The ideal control for Cooper Cutout—also for operation of Choke, Radiator shutter, Heater valve, etc. A twist of the wrist locks it in any position—an exclusive Cooper feature. Brass, handsomely nickel-plated. Beautiful, durable, convenient. Installation requires only $\frac{1}{2}$ " hole. Price \$2.50.

Sectional view showing heavy spring, rugged construction and extra large opening of the Cooper Special.

The Cooper

CUT-OUT

ENGINE TESTER AND CARBON OUTLET VALVE

By Far the Best for Engine Test And Backed by Continuous Advertising

THE SATURDAY EVENING POST—drives home its need—advertisements that ring with sincerity and bring motorists into your store. Next advertisement September 20th. Take advantage of it by using the Demonstrator Model, combining in one working unit Dash Control and Cut-out. Put it where customers can operate it—and watch sales jump. This Demonstrator furnished to dealers for \$2.00 (less than cost)—write today.

Coopers make motors "purrr"—A motor is "right" when it purrs as contentedly as a cat, and every motor "hits on all six" with a Cooper installed. Solid construction insures genuine service for life of car. Silent when it is closed. Installed easily, without detriment to the exhaust pipe, on any car.

FOR ALL CARS PRICES, VALVES ONLY

1½ in.	\$2.50	2¾, 2¾, 3.....	\$5.00
1¾, 1¾, 1¾.....	3.00	Chevrolet Special	4.00
2, 2¾.....	3.50	Cooper Valve, Complete with	
2¼, 2¾, 2½, 2¾.....	4.00	pedal for Fords.....	3.00

Order today from your jobber, or write at once for unusual dealer proposition.

COOPER MANUFACTURING CO.

419 South First Ave., Marshalltown, Iowa

Exclusive Sales Representatives

THE FULTON CO., MILWAUKEE, WIS.



Chevrolet Special
Price \$4.00



Cooper Jr. Dash
Control for Fords

Polished nickel hand-grip with black enameled plate \$1.25; With Cooper special for Ford. Complete, \$3.75.



Bring on the "Balloons"

CARS equipped with balloon tires steer harder—unless they are equipped with Ross Cam and Lever Steering Gears. And *then*—why, you'd never know the difference. Ross Cam and Lever Steering Gears render many valuable services. This is only one of them. *Write for the facts*

ROSS GEAR AND TOOL COMPANY, 725 Heath Street, Lafayette, Indiana

ROSS
CAM and LEVER  **STEERING GEARS**

EASIER STEERING LESS ROAD SHOCK

Make

Profits

*the
dominating factor
in your business*

PROFITS vs. VOLUME

1. Profit the Motive of All Business.
2. A New Business But Old Principles.
3. Where Profits Come From.
4. How to Determine Mark-Up for Profit.
5. Meeting Competition That Cuts the Percentage.

ECONOMICS OF PURCHASING

1. Profit Starts With Buying.
2. A Well Selected Stock.
3. Buying From Reliable Sources.
4. Take Discounts to Reap Profits.
5. Know the Merchandise You Buy and Sell.

UTILIZATION OF PLANT CAPACITY

1. Profitable Use of Plant Capacity.
2. Departments Essential to Transportation Store.
3. How Much Is Enough Space.
4. Displaying and Storing Stocks.
5. To Build or Remodel.

COST OF SELLING

1. Gross Margin Is Not Net Profit.
2. The Cost of Selling.
3. Overhead Must Be Met.
4. Salaries and Wages.
5. Maintenance Service As a Profitable Commodity.

TURNOVER OF CAPITAL

1. Relation of Profits to Capital.
2. How Money Works.
3. Your Banker Is Your Friend.
4. Turnover Creates the Margin.
5. In Return for Profit.

It's not the amount of business you do, but how much profit you make, that counts. Increasing the volume does not necessarily mean increasing the profits. On the contrary, many have found this past year that getting—say—the last 10% cost so much that it was not only unprofitable in itself but it wiped out some of the profit on the other 90%.

Since making money is the ultimate aim of all business, there is nothing more important than making the obtaining of satisfactory profits the dominating factor in your business.

A series of articles on this important subject will be published simultaneously in

Automotive Industries
Motor Age **Motor World**
Automobile Trade Journal

The major theme of all the series will be the same but the articles themselves, the writers, the treatment and the appeal of each will be different.

The subjects of the articles which will appear in this publication are given in the panel to the left.

Look for these articles. Make it a point to read them carefully. They are full of helpful suggestions on meeting the greatest question confronting the industry today.

Articles Start Issue Sept. 18

COOL NIGHTS boost Clymer sales

Sales on most accessories slow up with the advent of fall weather. Not so with the Clymer Safety Light.

Long, dark nights, and cool ones, *increase* Clymer's usefulness. Who wants to fumble with an outside spotlight when the curtains are up or the windows closed?

Clymer's full page ads in The Saturday Evening Post have been telling car owners how the Clymer makes night driving safe in every season.

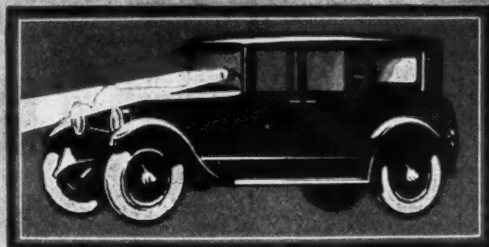
A certain share in the profits of this campaign belongs to you. Are you taking advantage of this opportunity for fall profits?

This is Clymer season—right now. Order a stock of Clymers from your jobber today.

Patented May 15, 1923 and July 15, 1924; others pending

CLYMER MANUFACTURING CO.
Rockford, Illinois

LEGAL IN YOUR STATE



THROUGH-THE-WINDSHIELD
Clymer Safety
LIGHT

9 perplexing questions answered at *6c a word!

How can I get a Better Job?

If in need of employment or seeking bigger opportunities, follow the Broadcaster want ads. If suitable employment is not offered, a "Position Wanted" ad may locate just what you desire.

How can I find competent Employees?

You want a man who will make good—someone whose record is evidence that he is ambitious, competent, progressive—he will naturally be a reader of his business paper. Advertise in it and from the replies select the man best fitted for your needs.

How can I get Agents or Representatives?

Those who are competent and up-to-the-minute—who will stick to the job after they have learned it—doubtless read their business paper for new ideas and inspiration. They also read the Broadcaster ads for such opportunities as you have to offer.

How can I turn Slow-Moving Stock into Cash?

A morgue of dead stock occupies valuable space to which it is not entitled—ties up your capital and cuts heavily into your profits. It can be avoided in your store or warehouse by offering in the Broadcaster of your business paper those items for which you have no local demand but which might be sold by someone else in another part of the country. Possibly the other fellow may be carrying as dead stock something you could sell at a profit. Broadcaster ads will span the distance between you and your prospects. Motor Age (Chicago), Motor World (New York), and Automobile Trade Journal (Philadelphia), with a combined circulation exceeding 80,000, offer wonderful opportunities for the exchange of slow-moving stocks.

How can I sell Equipment which I no longer need?

If in serviceable condition advertise it in the Broadcaster—it may be just what some other reader needs in a hurry. If you have anything that others are likely to want, or if you want anything someone else can supply a Broadcaster ad can help you.

How can I find Bargains in Used Equipment or Machinery?

Make known your wants through a Broadcaster ad. Some other fellow has just what you need and may be willing to sell at your price.

How can I get Partners or Financial Backing?

If you want as business associates those who are up-to-the-minute you want men who read their business papers. Broadcaster advertising will search the entire industry for just the kind of help or assistance you require. It works silently and efficiently. If a box number is used for the replies, its work will be done secretly and no one but the clerk who handles the advertising will know the name of the advertiser.

How can I sell Parts for Orphan Cars?

This is a 100 per cent Broadcaster proposition. The 80,000 readers of Motor Age, Motor World and Automobile Trade Journal represent about everyone in the country who repairs cars. Tell these men through Broadcaster advertising what you can supply and you will confer a favor upon those who need such items in a hurry. Dealers in parts find Broadcaster ads their very best investment.

How can I Sell my Business or find a Business Investment?

Thousands of men are ambitious to be their own boss—they have saved their money to buy a business of their own. An advertisement in the Business Opportunity section of your business paper will save you the real estate or brokers' commission. If you are offering or looking for an opportunity of any kind the Broadcaster can help you.

*** 6¢
a word**

is the single insertion rate for Broadcaster advertisements set regular want ad style in Motor Age or Motor World. Rates for displayed ads on request.

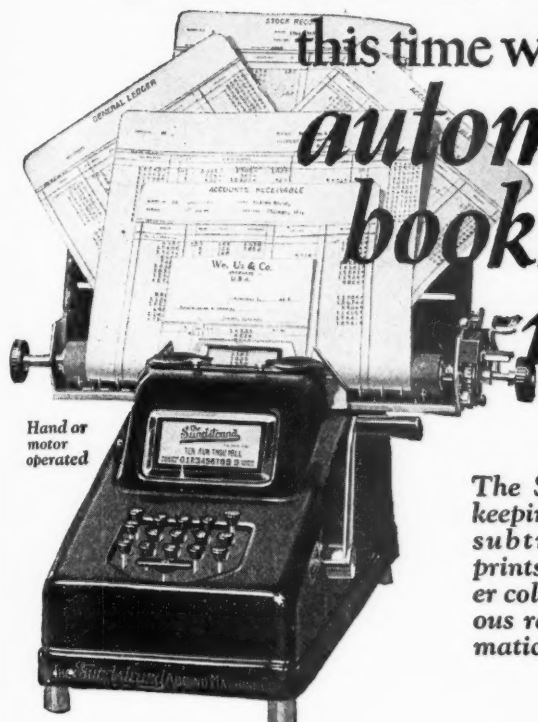
The Broadcaster

A DEPARTMENT THAT WILL FIND WHAT YOU WANT

For complete Broadcaster Rates in Motor Age, Motor World, Automobile Trade Journal, Automotive Industries, Distribution & Warehousing, address the Glass Journal Company, 5 South Wabash Ave., Chicago, or 239 West 39th St., New York.

The Broadcaster Department Appears in This Issue on Page 105.

-and again Sundstrand scores this time with a low cost automatic bookkeeping machine



The Sundstrand Bookkeeping Machine adds, subtracts or simply prints figures in the proper columns of your various record sheets, automatically as indicated

THE carriage automatically cross-tabulates, stopping as "ordered" by the instantly changeable stop plates, to record old balance—date—folio number—debits—credits—stock, in and out—deposits—withdrawals, etc.—all, including the newly computed balance, in the proper columns.

The operation is *simplicity itself*—typically Sundstrand—*nothing new to learn*. Simply write the amounts on the keyboard, touch motor bar or pull operating lever. The right column of the record sheet is in place and the wanted machine functions are automatically performed. Like its famous forerunner, the Marvel Model Direct Subtraction Sundstrand, this new Bookkeeping Machine is portable—desk size. *Subtracts direct* with 100% printed proof in one operation. Automatic shift multiplication. One hand control. Only ten keys. Visible. A speedy, low-cost service for all record work—bookkeeping, straight adding, subtracting, multiplying, dividing, checking invoices, extending inventory, stock records, calculating. Instantly adapted to *your* records. An all-purpose machine at a surprisingly low price. Let us explain its endless scope of usefulness—how it can serve you. Write for descriptive booklet. Address Dept. M-9.



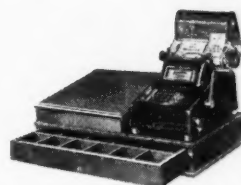
Sundstrand



SUNDSTRAND ADDING MACHINE COMPANY, Rockford, Illinois, U. S. A.
Sales and Service Stations everywhere in the United States and foreign countries

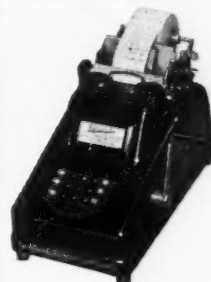
See this new machine at New York Business Show, 165th Armory, Oct. 20 to 25, 1924

or perhaps
you need
one or more
of these—



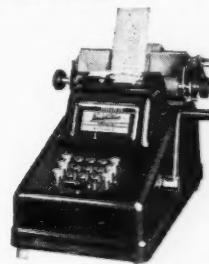
Sundstrand COMBINATION CASH REGISTER

A complete retail store service in one machine at one low cost—cash register and adding machine. Credit file furnished at slight extra cost. Saves hours of time, guards against errors, protects profits. Classifies sales by clerks and departments. Makes a nonerasable record. Forces correct indication and recording of cash, credit, paid-out, etc. You can read cash totals at any time. Tape rewinds and locks in machine. Famous 10-key Sundstrand Adding Machine—adds, multiplies, divides, etc. Prevents errors in checking sales slips and inventory sheets, footing ledger, bank balances, etc. Range—1c to \$99,999.99.



Sundstrand MARVEL MODEL 20 Direct Subtractor

Performs all calculations with only ten keys. The hand does not have so far to travel. Simply press the subtractor key and machine subtracts direct, furnishing 100 per cent printed proof. Portable—desk size—visible writing—automatic shift multiplying—adding—dividing—figuring. All in one machine at one low cost.



Sundstrand FIGURING MACHINE

Has all the features of the Sundstrand Marvel Model 20 with the exception of the direct subtraction feature.

Send the coupon for full details of the machine in which you are interested.

Sundstrand Adding Machine Co.,
Rockford, Ill., Dept. M-9.

Send me complete information concerning the machine I have checked.

☐ Combination Cash Register ☐ Marvel Model 20 Direct Subtractor
☐ Figuring Machine

Name _____
Address _____
City _____



18,000 miles
of perfect service from this

Life Timer for Fords

A Nationally known maker of tires sent us this LIFE TIMER commutator, which served one of their Fords for more than 18,000 miles. The tag tells the story.

Another organization, with headquarters in Michigan, told us of one run for more than 16,000 miles.

Frankly, these are unusual records, but, just as frankly, it is quite usual for a LIFE TIMER to operate perfectly for over 10,000 miles.

Lists at \$2.00

It should be easy to sell a \$2.00 timer for Fords which is so capable.

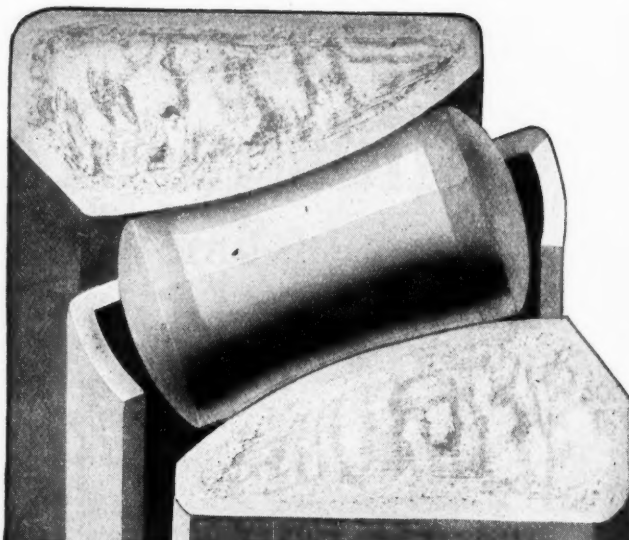
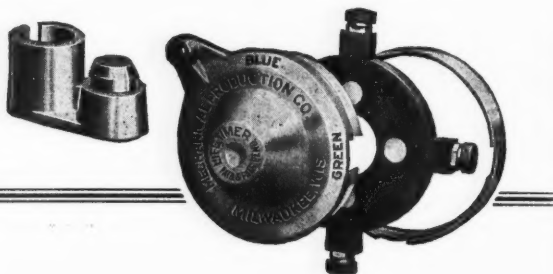
Our unconditional guarantee makes it easier to sell and the discount makes it profitable.

Ask your Jobber to ship a trial dozen in a display carton. If he has none in stock, ask him to order for you—he will.

Mechanical Production Co.

Milwaukee

Wis., U. S. A.



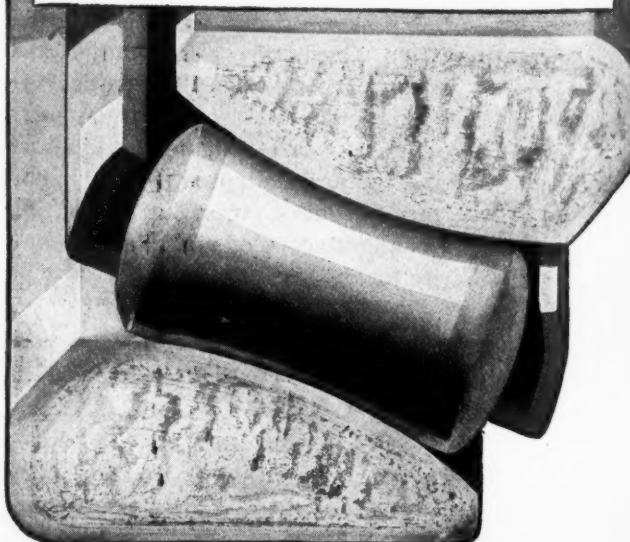
SHAFER

Self-Aligning ROLLER BEARING
PAT. & PATS. PENDING

PROOF of the Shafer principle is substantiated by the thousands of cars Shafer equipped, giving their owners long and satisfactory service. They are self-aligning and carry all combinations of thrust and radial loads.

*Furnished in
Interchangeable Sizes*

SHAHER BEARING CORPORATION
6501 WEST GRAND AVENUE
CHICAGO, ILL.





Polish up Sales with

HIGH LUSTRE FINISH

HERE is a real cleaner that greatly beautifies the surface of an automobile. It "CLEANS UP" any car and "CLEANS UP" for the jobber and dealer as well. National advertising is at work all over the country creating and sustaining a still greater demand. Sold with a fair and square policy, through jobbers only. Sells fast and repeats over and over again.

The Fastest Selling Article of its Kind

H L F moves off the shelves and keeps on moving. Every owner is a satisfied owner. This means repeat orders and added profits.

H L F is a Quality cleaner. It contains nothing that is injurious and will not form a dust-collecting film.

*Distributed exclusively through
the jobbing trade*

"CLEAN UP" WITH
H L F

H. L. FEASEL'S LABORATORY
9-11-13 DESBROSSES ST.
NEW YORK, N. Y.



A Powerful PUMP

Specially designed for use in
Service Stations



By buying now you
can secure "America's
Best Tire Pump" at
exceptionally good
terms. Correspond-
ence invited.

N. A. PETRY COMPANY, Inc.
North Randolph Street Philadelphia, Penna.

High grade, 5-ply
HOSE, 27 in. long
with LOX-ON CON-
NECTION. The abso-
lutely tight check valve
in base permits the use
of a valve deflating pin
making pumping easier.

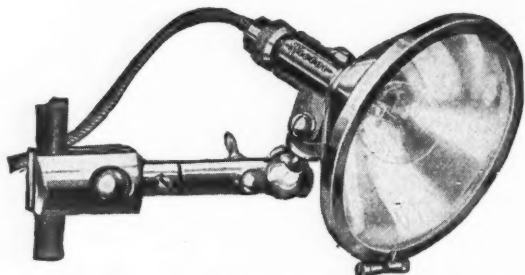
The high grade malle-
able iron BASE spreads
to allow full piston
stroke in the most con-
venient pumping posi-
tion. The feet can be
folded, and clamped with
wing nut for carriage.



Motor Age says—

Accessories or Necessities

THERE are some accessories which when once used by the car owner are thereafter looked upon as necessities. Take the spot light, for instance. Glaring headlights are recognized as one of the greatest evils and dangers of motoring at night off of the lighted streets of the city. The danger is greatest on paved roads where there is a temptation to drive fast. The headlights of an oncoming car, if they are powerful enough to do the driver of that car any good, will blind the driver going the other way. But the driver who has an efficient spot light trained on his edge of the road at a reasonable distance ahead has a lighted area upon which he can focus his vision without the slightest danger of being confused by the bright lights coming the other way. The way to sell spot lights is to demonstrate them on country roads. It is a rare car owner who would consent to have a good spot light taken off his car.



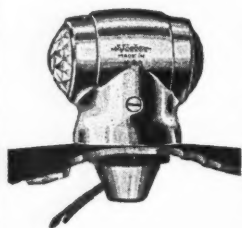
**No. 100
Spot
Light**

Victor Spot Lights are made to give the kind of efficient service that modern motoring demands. They are mounted on adjustable brackets that operate easily but will not jar out of position. A safety stop prevents flashing into the eyes of an approaching driver.

They are made in several different models and sizes for open or closed cars.

Victor Spot Lights are choice specimens of the lamp makers' art. Quality of material and workmanship is consistently combined.

The price is right and the discount long. Get our catalog and stock the line that brings in the profits.



**No. 47 "Firefly"
Parking Lamp**

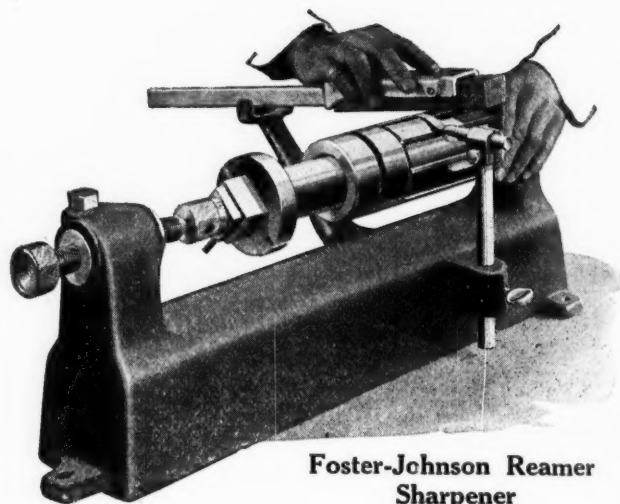
The "Firefly" is a miniature two-way beacon that uses a very minimum of current. It is equipped with intensifying jewels that project a white light forward and red to the rear. Made in a one piece, sturdy casting and finished like a piece of jewelry.

A small item that fills a big demand. A fast seller and a profit maker.

Victor

THE CINCINNATI VICTOR COMPANY
714 Reading Road Cincinnati, Ohio

Re-Conditioning Tools Every Shop Should Use



**Foster-Johnson Reamer
Sharpener**

KYLIN General Purpose Reamers are designed to give the garage owner an extra means of handling motor re-conditioning work. They are adjustable, and though different in construction from the regular F-J Piston Reamers, operate with equal thoroughness. Each and every blade of the Kylin Reamer expands to the same identical diameter, producing a uniform depth of cut which is essential to the production of a quality job.

THE speedy and dependable adjustment of Kylin reamers enables you to complete a hurry-up job in the time usually required to adjust an ordinary reamer.

FOSTER-JOHNSON Reamer Sharpeners provide you with facilities for keeping your reamers in first class condition. No shop is complete without these items of Foster-Johnson equipment.

Write for our Station Manual and Catalog of Re-conditioning Tools. Let us show you opportunities open to the shop that is Foster-Johnson equipped.

FOSTER-JOHNSON REAMER CO.

1312 Beardsley Ave., Elkhart, Ind.

If you would tell the car owner how much grief is going to develop from that play in his "Universal," you would find it a great help in building up your service business.

Explain that the play is due to wear caused by lack of attention generally given universals and you will have little difficulty in selling many of these customers a

"MECHANICS" Oil Lubricated Universal Joint

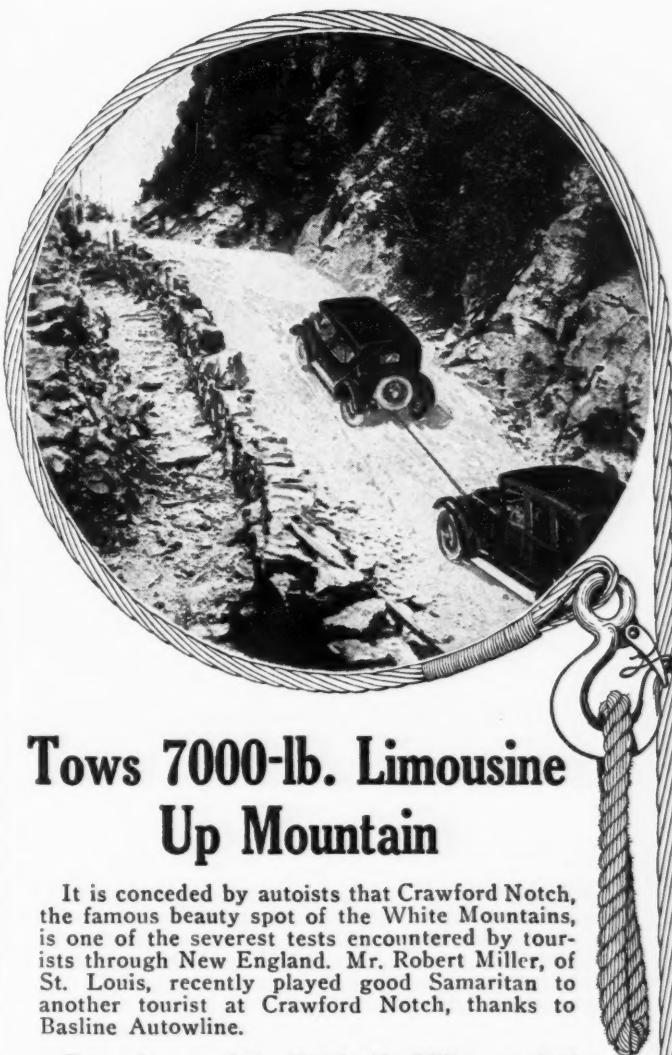
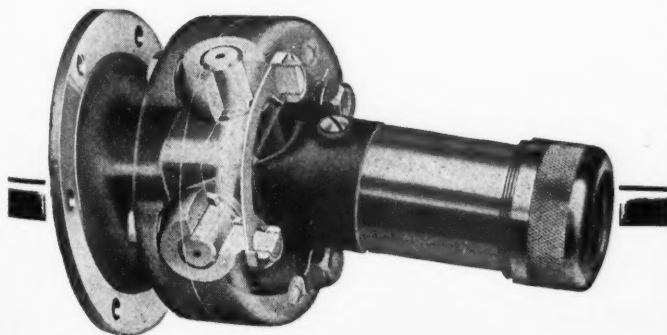
You can assure them that the "Mechanics" is unusually strong and will give years of perfect service with no more attention than that required to oil it once or twice a year.

—that once the good "MECHANICS" is installed, they are through with all the grief traceable to an inefficient universal joint.

Delivered to you, filled with oil ready to install. Good discount and ease of installation gives you a good profit.

Wire or write for full information and prices.
This is the time to do it.

MECHANICS MACHINE CO.
Rockford Illinois, U. S. A.



Tows 7000-lb. Limousine Up Mountain

It is conceded by autoists that Crawford Notch, the famous beauty spot of the White Mountains, is one of the severest tests encountered by tourists through New England. Mr. Robert Miller, of St. Louis, recently played good Samaritan to another tourist at Crawford Notch, thanks to Basline Autowline.

From the top of the Notch, Mr. Miller watched his chauffeur tow a disabled limousine from the very foot clear to the top, and then a half-mile beyond to the Crawford House garage.

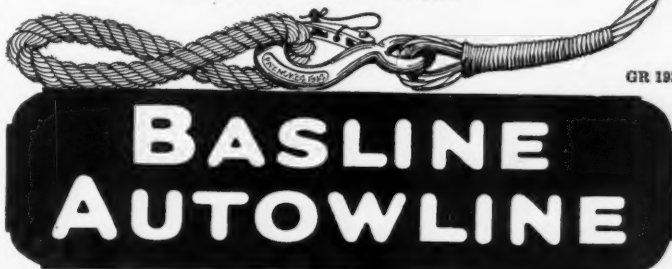
Mr. Miller says: "I judge that the limousine my chauffeur towed weighed 7000 lbs. or more. This is certainly a sufficient test for 'Basline Autowline.' My chauffeur has since put the same line to severe tests in towing other cars, which would indicate that the line was not hurt by its first severe test."

BASLINE AUTOWLINE, the "Little Steel Rope with the Big Pull," is made of famous Yellow Strand Wire Rope. You can depend on it to pull you out of trouble every time. Fits under seat cushion.

Money for Jobbers and Dealers:

Basline Autowline pays you a good profit, it sells well, and is the **ONLY** Nationally-Advertised towline on the market. Push it this season.

BRODERICK & BASCOM ROPE CO.
ST. LOUIS — NEW YORK



OR 193



DEALERS: 80%

of the farmer car owners use tube patch when they can get it, according to the assertion of hundreds of farmers who were personally interviewed.

The largest patch advertising campaign ever run in farm papers is right now appearing in eleven publications with a combined circulation of 4,000,000.

ANY dealer who will DISPLAY Las-Stik can sell it in quantity. It is the fastest selling tube patch, with sales increasing every year.

Las-Stik Patch Mfg. Co.
HAMILTON OHIO



"REFLECTOR" MOTO-METER LIGHT AND ORNAMENT

This little addition to the millions of Moto-Meters will complete this essential article.

A handsome addition as well as a greatly desired necessity.

The field is tremendous and profits quick.

Moto-Meter Must Be Seen to Be of Greatest Value

This bullet type lamp is studded with many colored jewels. Device reflects the light directly upon Meter face to be clearly read from seat.

Easily attached. No holes to bore. No defacement of meter or parts.

Like other Consolidated Jeweled products this is a big business booster.



List \$2.50

Patent Applied For

CONSOLIDATED AUTO DEVICE CO.

515 North Green St., Chicago, Ill.

ONLY APEX Innerings

Hold



Live Tension

All the spring in an APEX Innering cannot be destroyed, no matter how hard you try. Bend it; squeeze it; burn it up inside the motor—and you'll never take out all the live tension. Yet this special steel can be adjusted to any degree or tension required. This makes Genuine Apex Innerings the only safe way to stop oil pumping without rebor-ing.

Buy no imitations—always insist on Genuine APEX Innerings.

At little cost to your customers you can stop oil pumping and piston slap—yet your profit proportionately is bigger when you consider how quickly "APEX" can be installed, and how many jobs you can handle.

Most good jobbers stock Genuine APEX Innerings. If yours does not, accept no substitute. Send your order direct. We'll ship at the same discount jobbers allow.

20c each

Retail up to 3/4 inches wide or 5 inches diameter; larger, 35c each.

THOMSON MFG. CO.

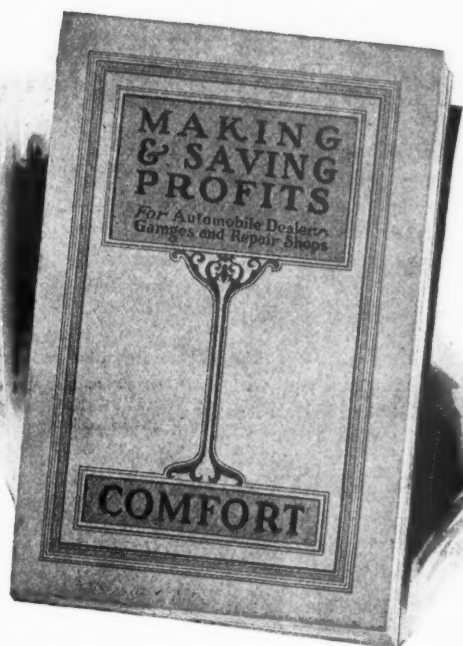
Dept. C

Peoria, Ill.



"If it isn't an APEX—It isn't an INNERING!"

Your Profits!



This book tells owners of garages and auto repair shops how to make and save profits—not by increasing prices but by safeguarding each sale or repair job so that the dealer always gets every cent that is rightfully coming to him.

Articles On:

Sales Campaigns
Used Car Problems
Service Departments
Preventing Losses on Gas and
Oil Dispensing, Etc.

You are sure to make money and build up a big business if you follow the simple, practical, commonsense suggestions contained in this 68 page book, which is fully illustrated.

Sent free to any owner or manager of a garage or repair shop who will write for it on his business stationery. Costs but a 2 cent stamp and will save you many, many dollars!

Comfort Printing Specialty Company

101 N. EIGHTH ST.

ST. LOUIS, MO.



Broadcaster Service

If you are in the market for something that you do not find advertised in this paper, tell us and we will promptly send you a list of the leading manufacturers.

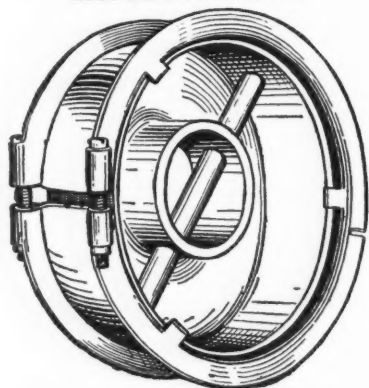
If you want anything, and do not know how to get it or to whom to send your inquiry, write us and we will do our best to help you.

The Broadcaster
A DEPARTMENT THAT
WILL FIND WHAT YOU WANT

The Broadcaster Department Appears in This Issue on Page 105.

No. 43 Sta-Rite Fan Pulley Rim

A FLANGED RIM FOR 1921 AND LATER
MODEL FORD CARS



Price 60 Cents Each

Packed in individual cartons.

Much difficulty has been encountered from the fan belt running off the pulley on the late model Ford cars, due to slipping of belt when engine is started. The Sta-Rite Fan Pulley Rim has been designed to overcome this trouble. It can be applied by anyone by merely loosening up the screws and slipping the flange over the pulley which is on the car until the projections on the rim come against the front of the pulley, then tighten up the two screws on the rim and the car is ready to run. Be sure to have the belt tight before starting the engine.

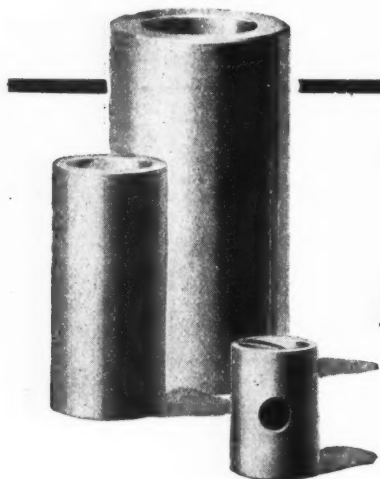
The belt will not slip off when the Sta-Rite Rim is used.

We also make forty other Automobile Accessories

Manufacturers' Agents write for our proposition.

Banner Accessory Manufacturing Co.

2629-33 LaSalle Street,
St. Louis, Mo.



**Write for
These
Bushings
Price Lists**

The most complete, the most convenient and most understandable automobile price lists ever published.

Supplement No. 11

Piston Pin Bushings. Listed under Motors.

Supplement No. 12

Finished Bronze Bushings. Listed under sizes.

Supplement No. 13

All Standard Quality Bushings, under names of cars.

Write for your copies today.

Johnson Bronze Co., New Castle, Pa.

JOHNSON



SAFETY Front Wheel Brakes

Can be attached to ANY MAKE of car. Wonderful overhaul opportunity as every motorist wants to be up-to-date. Operates from the regular brake-pedal. Permits any car to stop in less than **HALF THE DISTANCE** required with rear wheel brakes alone. Safety feature appeals to all—especially women-drivers. Absolutely no danger of skidding.

Don't pass this up. It is one of the biggest money-making opportunities you will have this year. Write us **NOW** about this. Big discounts.

GREEN ENGINEERING COMPANY

740 MAIN ST., DAYTON, O.

Distributors for Front Wheel Brakes: Pedro, Cal.; Walker Auto Supply only. H. F. Morgan, Tampa, Fla.; Co., New Kensington, Pa.; John Reid Air Spring Sales Co., Pittsburgh, Pa.; Clarion Buick Co., John B. Mezey, New York City; Clarion, Pa.; Kittanning Buick Co., McCarthy Bros., Inc., Philadelphia, Pa.; F. L. Wirick, San

If you want to sell or rent your business you can

- (1) Put signs in your windows—to attract the attention of those who pass by.
- (2) Put an ad in your daily paper—to be seen by some of your local prospects.
- (3) Put an ad in your business paper to be read by others in your line of business, some of whom may be looking for just such an opportunity as you have to offer.

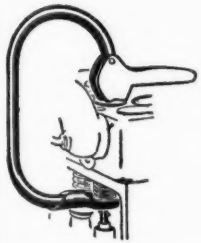
There are thousands of men in this industry who are ambitious to be their own boss—they have saved their money to buy a business of their own and might pay you a higher price than you have yet been offered.

The cost is too small to cause hesitation. Undisplayed ads are only 6c a word. The quicker you send your copy the sooner the dividends on your investment.

The Broadcaster
A DEPARTMENT THAT
WILL FIND WHAT YOU WANT

The Broadcaster Department Appears in This Issue on Page 105.

Take 'em out Faster!



Beardsley
NEVERSLIP
VALVE LIFTER

Here are two tools which will speed up valve grinding jobs in any shop. The Beardsley Never-Slip Valve Lifter makes valve removal fast and safe. It holds the spring up and the valve down. Both hands are left free to remove the pin. Saves time and saves the fingers for it cannot slip, bend or break. Every garage or service station should have at least one of the three models—

Universal, adjustable (fitting 95 per cent of all automobile motors with removable valves).....\$3.00 List
Ford Model as illustrated (with this lifter all eight valves can be removed in eight minutes).....\$1.00 List
Combined Fordson and Dodge (fits either perfectly and is used by most every Dodge and Fordson service station throughout the country).....\$1.50 List

Grind 'em in Quicker!



\$3.00

Beardsley
HI-SPEED
VALVE GRINDER

The Hi-Speed Valve Grinder comes equipped with attachments to fit all valves. Constructed on the screw driver principle (admitted best by both engineers and mechanics) this valve grinder gives a wonderful seat in very short time. Long strokes rough the valve down quickly—short strokes provide a perfect finish. A tool every repair shop can use to profit!

Both Lifters and Grinders packed in individual cartons. Ask your jobber—if he can't supply you, order direct.

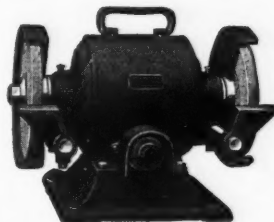
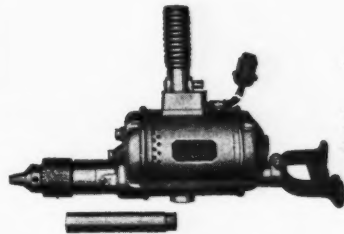
THE LOOMIS BEARDSLEY COMPANY

1231 South High, Columbus, Ohio

The Cincinnati

**1/2" Garage Special
Electric Drill Ball
Bearing Universal
Motor**

Price \$58.00



**6" Two-Wheel
Bench Grinder
Alternating
Current**

Now \$35.00

The "Cincinnati" line is complete, including extra attachments for valve grinding, carbon cleaning and other special automotive work.

Write for catalog

THE CINCINNATI ELECTRICAL TOOL CO.

1515 Freeman Ave.

Cincinnati, Ohio

New York, 50 Church St. Philadelphia, 1220 Real Estate Trust Bldg. San Francisco, W. H. Gilbert, Jr., 1710 Larkin St. Cleveland, 517 Bangor Bldg.

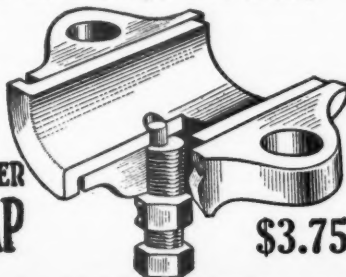
SAVE TIME! IN STOPPING END-PLAY IN THE FORD CRANKSHAFT



The C-A Adjustable Bearing presents a new and better way of stopping Ford crankshaft end-play. A cheaper, easier method that POSITIVELY corrects this cause of hard starting, poor lights, knocking and the many other troubles due to destructive end-play. A real quality device. Easily and quickly installed—leave the motor in and simply drop the oil pan. Let us tell you how to stop end-play without "pulling" the motor.

**ADJUSTABLE BEARING
COMPANY, INC.**
Dept. 401
BRAZIL, INDIANA

**ADJUSTABLE CENTER
BEARING CAP**



\$3.75



**They fit into place perfectly
—and profitably**

Peerless Fenders for Fords are patterned after the standard equipment, and are made of 20 gauge steel. They fit into place perfectly and have a durability that will outlast the life of the car.

The Ford market represents half the cars on the road and the need for fender replacement

gives you selling opportunities all year 'round.

Make every replacement need a Peerless sale. Put Peerless Fenders on display. When a Ford owner sees these black enamelled beauties he's sold.

Get a line on the Peerless Line today. Write.

THE CORCORAN MFG. CO.

Cincinnati, Ohio

for
Ford
Cars

**PEERLESS
FENDERS**

for
Ford
Trucks



Attractive Sales Tags

for Auto Showrooms furnished with 5x3 cards to fit, made of rich blue imitation leather, transparent front. Trade-marks of any car and frame stamped in gold.

Price in lots of 3, \$4.00—6, \$6.00 Postpaid

Send check to

ART BOOKBINDING CO., Inc.
119 West 42nd St., NEW YORK

New Departure Ball Bearings

Outsell because they Excel

The New Departure Mfg. Co., Bristol, Conn. - Detroit - Chicago



UNION FUSES AND ACCESSORIES

Fuses for every make of car. Fuse Block protects Ford lights and wiring. Also Fuse Boxes, special parts, stampings, etc.

Guaranteed satisfactory by oldest and largest manufacturers of electrical protecting devices. Write for catalog

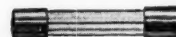
CHICAGO FUSE MFG. CO.

Chicago

New York



No. 1 AG

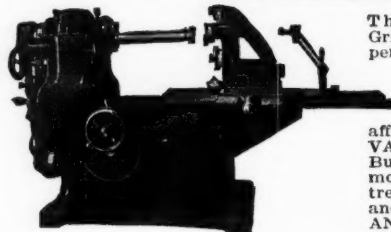


No. 3 AG



UNION

LANDIS



The LANDIS Cylinder Grinding Machine is the perfected product of the world's largest exclusive grinder builders. Because of our volume we can afford to give you MORE VALUE for your money. Built expressly for automotive repair shops. Extremely simple in design and operation. Don't buy ANY machine without first getting a LANDIS quotation. Catalog.

Landis Tool Co., Waynesboro, Pa.

New York Office—30 Church St.

You get quality work, SAE specification materials, and the right price if you send your connecting rods to a Watkins plant for rebuilding and refuse imitations of



New bolts and nuts, laminated shims, new piston pin bushing are part of the rod rebuilding at no extra charge.

New Bearing tinned in the rod and broached to mirror finish fits quickly to crankshaft and cuts time on flat rate repair jobs. Practice sending your rods in regularly. There's profit in it.

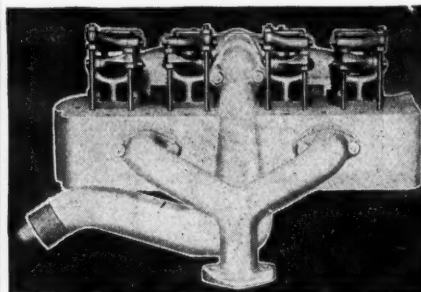
WATKINS Complete REBABBING SERVICE

"One Day Service from factory nearest you"

Chicago, Ill., Berguson Skinner Corporation.
Hartford, Conn., Ripley Motor Services, Inc.
Indianapolis, Ind., Indiana Watkins Mfg. Co.
Kingston, Ont., Watkins Mfg. Co. of Canada, Ltd.
Los Angeles, Calif., Wright Mfg. Co.
Memphis, Tenn., J. B. Cook Auto Machine Co.
Minneapolis, Minn., Wright Manufacturing Co.
New York, N. Y., Lake Sales Company.
Omaha, Nebr., Interstate Machinery & Supply Co.
Portland, Ore., Factory Motor Car Co.
St. Louis, Mo., H. & H. Machine Co.
Seattle, Wash., Solon Grinders Co.
Syracuse, N. Y., Watkins Mfg. Co. of New York
Toledo, Ohio, Stewart-Burgan Co.
Washington, D. C., R-L Motive Parts, Inc.
Waterloo, Ia., All States Rebabbing Service
Wichita, Kans., Home Office, The Watkins Mfg. Co.

ROOF 16 OVERHEAD VALVE EQUIPMENT For Ford and Dodge Motors

ROOF 8 VALVE HEAD FOR FORD MOTOR



Stupendous Power—Lightning Speed

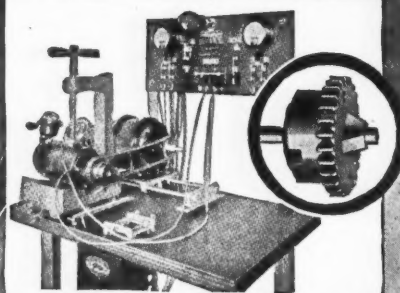
Ford racing cars with Roof Equipment are rivals on mile and one half mile tracks of the highest priced racing cars. Doubles the pulling power of the Ford or Dodge pleasure car or truck. Hill climbing and general road work beyond wildest dreams of the owner. Complete—ready for installation—no machine work necessary. We are headquarters for all speed equipment. No matter what you want, write us. Racing quality—lowest prices. A postal card brings you complete list of our specialties.

Jobbers—Dealers—Consumers—Write Us.

THE LAUREL MOTORS CORPORATION, ANDERSON, INDIANA

EXCELSIOR TEST BENCH

With the Positive Drive and Speed Control



INCREASE YOUR PROFITS!

Starting, lighting and ignition pays bigger profits than any other branch of automotive service.

The Excelsior Test Bench

equips your shop complete for this work.

Price \$385.00

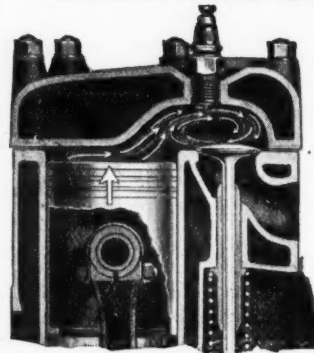
Payable \$50 per month

Write for bulletin 975M

WEIDENHOFF

4350 ROOSEVELT ROAD
CHICAGO, ILL., U.S.A.

The Ricardo Head



Mass response followed the announcement of four-wheel brakes and balloon tires. Now, the car-buying public looks for improved engine design—increased performance at lower cost and the new standards of ease and certainty the Ricardo Head provides. Thus, immeasurable sales value is added to the product that's "Ricardo Head-equipped."

WAUKESHA

Motor Company

ENGINE BUILDERS

Waukesha, Wisconsin

New York, N. Y.

MORRISON AUTOMATIC DOUBLE RANGE WORM DRIVEN JACKS

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A 100% BALLOON TIRE JACK. Most efficient for all MOTOR VEHICLES, from the lightest passenger car to the heaviest truck. Made in nine sizes.

The MORRISON LINE OF JACKS is low enough and high enough to meet every requirement, and is in great demand among the motoring public.

FOLLOW THE LEAD of the best automobile Engineers of America when you buy a jack.

"SURE HOLD"
STEEL FLEXIBLE
CAP

Prevents
Slipping

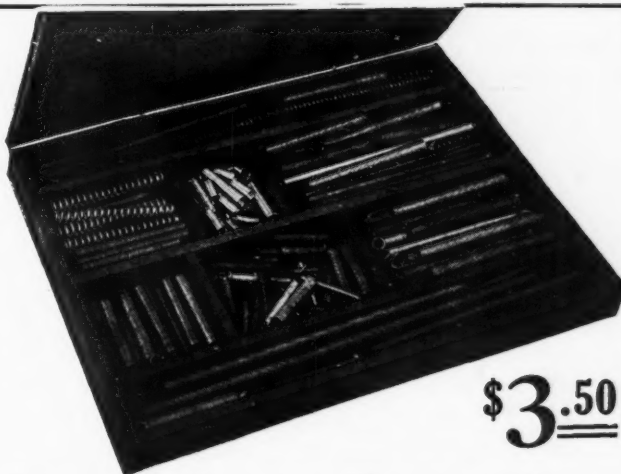
Standard equipment with more than fifty automobile manufacturers. We invite jobbers and dealers to write us for a good selling proposition. Easily lifted under or away from car by special socket. A feature your buyers will approve.



THE
"KING OF JACKS"

MANUFACTURED BY THE
Woods Engineering Co.
Alliance, Ohio

All the Springs You Need



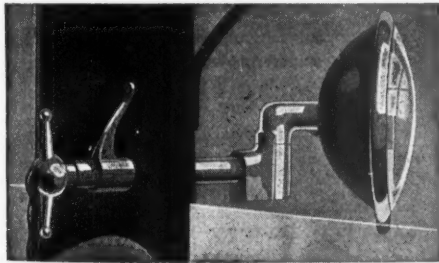
Here Is a Bargain

A wide assortment of fine quality coil springs ready for immediate use and covering the jobs that come in every day. Packed in a handy, well made box arranged in compartments so you can pick out just the spring you need when you need it. A good seller over the counter, too, for the car owner. Just what he needs and just what every garage and service station can use with profit in money and time. Order the big money's worth today. Only \$3.50 for a wide assortment of springs for every use—right at hand when you want 'em. We have a very interesting sales plan for Jobbers. Drop us a line today.

THE PECK SPRING CO.
Plainville, Conn.

PFAFF SPOTLIGHT Inner Control Sells Easily at \$10.00

This spotlight is so substantial and so beautifully finished that car owners can hardly believe the price is so low.

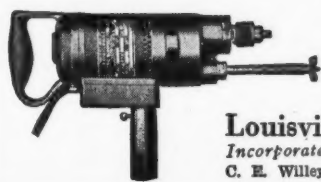


It is easily installed by drilling a 3/8" hole in the corner post — no broken wind-shields. Can be turned in any direction at the will of the driver.

Liberal discount makes this a mighty attractive accessory.

Pfaff Mfg. Co.
6340 Stewart Ave.
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Get This "Pioneer" \$65 Garage Special



Electric Drill
and Valve Grinder

Greatest time and money saver, as well as money maker, for your shop—

"It Will Do The Work"

Louisville Electric Mfg. Co.
Incorporated Louisville, Ky., U. S. A.
C. E. Willey, Pres. J. B. McFerran, Secy.-Treas.



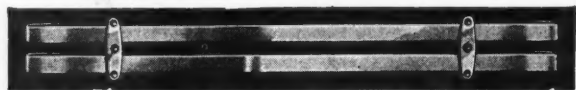
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it's THE
HOLLENDEN
HOTEL



Lycoming
MOTORS
FINE FOURS AND EIGHTS—IN—LINE
LYCOMING MANUFACTURING CO., Williamsport, Pa.

“CONNEAUT” Plastic Metallic Packing

Patented
Stops the leaks in automobile water pumps. Mold it with your fingers. Makes a smooth metal bearing—adjustable and practically frictionless. At your Jobbers—Get it today. It does the trick. Put up in 1 lb. cans. If your Jobber doesn't carry it, write us direct. Price \$1.65 per pound, f. o. b. Conneaut, Ohio.
The Conneaut Packing Company Conneaut, Ohio



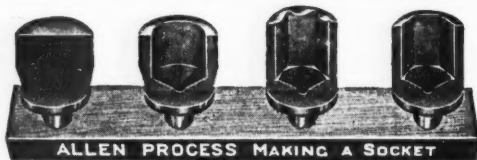
Spring-steel, Oil-tempered Bumpers in Six Complete Styles. Guaranteed Satisfactory Attaching Arms for all Leading Makes of Cars.
We invite comparison in appearance, quality and price.
THE BELLEVUE MANUFACTURING CO., Bellevue, Ohio

Kawneer

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STORE FRONTS

Write for Special Book Garage Fronts
THE KAWNEER CO., 1219 Front St., Niles, Mich.

Cold-
Drawn
Sockets



ALLEN
Wrench
Sets

ALLEN PROCESS MAKING A SOCKET
The Allen Manufacturing Company, Hartford, Conn.

Let us send you our FREE Catalogue on

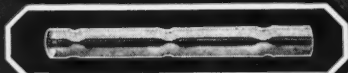
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Huetter Machine & Tool Co.
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Now offering both the matchless Peerless
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"REQUIRES
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FOR FORD CARS

Makes riding and driving a pleasure. Eliminates road shocks and hard steering, spring breakage, shock absorbers. Write for our money making dealer proposition.
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Over 110,000,000

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Tapered
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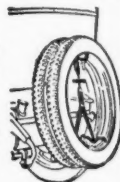
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**A MONEY MAKER FOR
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When a car owner sees this piece of equipment he wants it—he realizes what a great convenience it will be. This accounts for the record breaking sales now being made.

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Second Spare Tire Carrier and Rim Tool carries second spare—locks both spares against theft—attached or removed without tools—tires cannot chafe—contracts and expands rim when changing tires. Only one size to stock for all cars. Write for details.
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THE QUINCY SILENT AIR-MASTER

The Most Air Per Dollar Cost

WALL PUMP & COMPRESSOR CO.
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Gasco Air and Water Service

Attract favorable attention. Equip with a modern, artistic Gasco Station. Built to operate always under hardest usage and to last under severest conditions. Write for complete buying information.

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Send U. S. Your Armature Repair Work

FORD
ARMATURES
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\$2.00



MOST ANY
TWO UNIT
GENERATOR
ARMATURE
\$5.00

ALL WORK GUARANTEED—WRITE FOR PRICE LIST
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Quality Windshield
Wings and Mirrors

The line with the exclusive sales-and-service features. Order from your jobber.

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Cushion
Bumper
for every car



"PROTECTION
WITH DISTINCTION"
THE BIFLEX CORPORATION, Waukegan, Ill.

Cars that sell

in quantity backed by the squarest dealer contract ever drawn up. Write for details of the Willys-Overland Franchise.
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Big money in this service

Dealers and shops make big money through the control of a franchise which entitles them to the exclusive use of the patented "KLEAN RITE" system of washing and polishing automobiles.

This system has turned a job into an impressive, highly profitable business.

Write for full particulars.

Klean-Rite Auto Laundry Company

1710 East 75th St.

Chicago, Ill.

Meachem Gear Rings for Fly Wheels

Quality rings at lowest prices. Get our list.

MEACHEM GEAR CORPORATION
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YOU CAN'T FORGET TO LOCK IT

For
**FORD
Cars**

Automatic, safe and positive protection against theft. Approved by Underwriters' Laboratories. Earns lowest theft insurance rate.
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All in the Metal**G-H TENSION RINGS**

G-H Tension Rings of the finest steel, properly tempered, not only make but keep old motors running like new—Stop piston, slap and oil pumping. Real TENSION Rings—not just inner rings.

G-H Tension Ring Co., Inc.
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CYLINDER HEAD

PERFECT PERFORMANCE

The remarkable showing of the three Fronty-Fords in the 500 mile race was due solely to the Frontenac Cylinder Head. This head is adapted for use on YOUR Ford by its designer and builder, Arthur Chevrolet. Book, "How to Build a Fronty-Ford," \$2; free with orders of \$50 or more. Write for FREE catalog.

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More
Power
Less
Fuel

Zenith - Detroit Corporation, Detroit, Mich.

YOU can handle this body PROFITABLY

HYMAN PRESSED BODIES

THE HYMAN PRESSED BODY CO.,

All steel construction provides lightweight with extreme strength. Outlast chassis. One design fills most light truck user's requirements. Ton and Half-ton sizes. Shipped knocked down. Low priced. Distributor and dealer terms liberal. Write,
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FOLLETT'S NEW MODEL TIME STAMP

—accounts for every labor minute



Learn the interesting details from our descriptive data.

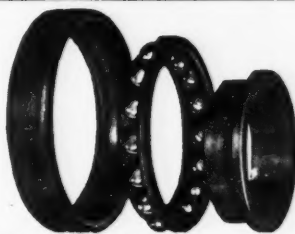
Prints the year, month, day, hour, minute, A. M. or P. M. at the exact moment the plunger is pressed—like this, for example:

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Tells when a job is started—and when it is finished. There can be no dispute over the time charge.

Absolutely automatic—except for winding. Every machine guaranteed.

Follett Time Recording Co., 217 High Street, Newark, N. J.
 "Established Since 1904"



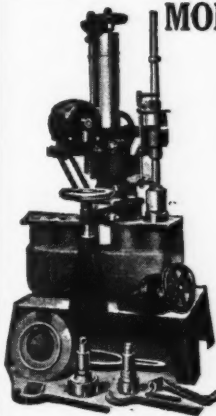
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Lancaster, Penna.

Angular Contact Radial Bearings and Angular Contact Thrust Bearings. Manufacturers of Thrust Ball Bearings for all sizes and types of machines. Standard sizes of Thrust Ball Bearings and Special Thrust Ball Bearings.

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STORMIZING machines are truly money makers. They enable you to make biggest profits on every overhaul job. They handle all your cylinder renewing, accurately and efficiently, enabling you to turn out the high quality work that wins your customers' lasting approval. The automatic time and labor saving features make big profits possible by lowering operation costs.

Write for the Storm Book,
 "Modern Cylinder Methods"

STORM

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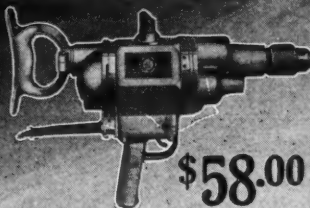
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SPECIAL
HALF-INCH
DRILL

"With the Pistol Grip
and Trigger Switch"



\$58.00

THE BLACK & DECKER MFG. CO.
 Towson, Md.

Boxed in 25 ft. Coils

Smalley

Ready-shaped
Inner-Rings

List Price
\$3.00

*"Cut
the Ring
to fit the
Job"*

Smalley Accessories Corp.
2223 Cottage Grove Ave.
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140 Combinations

—all in this ONE set

Everything you need, in one small box, compact, accessible, and a real mechanic's outfit. Sockets will not break. Fully guaranteed. Ask your dealer or write us.

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"STRAIGHT LINE" DRILL CHUCKS

When buying Portable Electric Drills be sure to look for the distinctive ALMOND CHUCK, which may be easily identified by the "STRAIGHT LINE" milling on the chuck body.

Write for complete information regarding the new ALMOND "STRAIGHT LINE" CHUCKS.


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Dust and Valve Cap
Off or On in 5 Seconds

The Dill Manufacturing Co. Cleveland, O.



For replacement in all makes of auto vehicles—

Thompson Silcrome Valves

[they will not burn]

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A selling feature—and a very essential feature, too, are VESTA BATTERY ISOLATORS—a mark of merit in Vesta Batteries for the past 8 years. Write for literature.

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An
Exclusive
Vesta
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RE-TURNING
TOOL

The Auto Hone Co., Buffalo, N. Y.

Yes!

Outperforms any car in its class

GARDNER

BUILT BY THE GARDNER MOTOR CO.—BUILDERS OF VEHICLES SINCE 1882




INSHIELD DRIVING LIGHTS

INSIDE THE WINDSHIELD—NO GLASS TO CUT

INSHIELD 8 4 1/2 in. diameter. Heavy Nickel or Black Enamel. Made of heavy sheet brass. 21 c. p. Mazda precision type tipless bulb, silver, triple-plated reflector \$7.50	INSHIELD SENIOR 5 1/2 in. diameter. Nickel finish only. Simplest and best inner-controlled driv- ing light made. \$10.00
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Patented Oct. 30, 1923



UNIVERSAL HOSE CLAMP

Adjustable. Two sizes will clamp any hose of any diameter. Made from cold rolled steel out of wire. No rough edges to cut hose. Put on in less than a minute. Everlastingly leak-proof. Order Universal Hose Clamps. Trademark on every clamp and carton. Get them from your jobber—or write us.

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Fan Belts and Radiator Hose

Made By

The World's Largest Makers of Fan Belts

Dealers
Every
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INSIST UPON




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SILENT TIMING GEARS

MADE OF
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Over a
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USE THE AMMCO

Cylinder Re-Conditioning Tool

Regrinds and refinishes cylinder bores. It is self-adjusting, self-aligning and self-centering. Write for Bulletin.

Automotive Maintenance Machinery
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Attractive in appearance, with cleaning features of removable heating coil with no connecting joints inside the heater pan to leak. Meets instant approval. No odor or noise. Easily installed and operated. Will boost your winter sales—get our attractive trade proposition.

THE NORWALK AUTO PARTS CO.
Norwalk, Ohio



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GARAGE AND SHOP EQUIPMENT

WEAVER
MANUFACTURING
COMPANY
SPRINGFIELD
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U.S.A.

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At last—a headlight reflector that makes night driving safe.
Write for full details.

The PARAFLECTOR CO., Minneapolis

Hycor

Brake Lining

FOLDED AND STITCHED
HYDRAULIC COMPRESSED

Millions of feet
annually installed
as factory equipment
THE MANHATTAN
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PASSAIC, N.J.

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HEAT-SHAPED PISTON RINGS

Heat shaped to in-
sure perfect round-
ness, sold at almost
the price of a snap
ring.
Wilkening Mfg.
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phia, Pa.



Cyclo "Dynamic" Hot-Spot for Fords

This "Modified Vapor" manifold gives a gas with lots of "kick" in it for hill-climbing — exceptionally smooth running and economical at all seasons. Vacuum control varies the heating inversely with the load.

The best permanent proposition for dealers.

CYCLO MANIFOLD CO.

High & Chestnut, Akron, Ohio

"Turn Miles Into Smiles"

with **Stewart** SHOCK ABSORBERS

\$30 per set of four (\$1.00 increase in west)



\$5

Wood-Imes

Water Circulating Pump
For Ford Cars and Trucks

Is as reliable as the Ford Car itself and as-
sures a positive cooling system that constan-
tly functions. No more overheating—No more
freezing in travel—Made engineeringly cor-
rect of best materials—quickly and easily in-
stalled. Write for Dealer Discounts and com-
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Formerly Mid-West Mfg. Co.

JOHNSON Gas Appliances

Metal-Melting Soldering Heat-Treating

JOHNSON GAS APPLIANCE CO.

Cedar Rapids IOWA

Pacific Coast Repr., C. B. Babcock Co., San Francisco, Calif.
New York Office—277 Lafayette St.



Lowest Priced Method of Efficient Spring Lubrication

R & C Oiler comes in 30 ft. rolls. One roll
will equip from 6-12 cars. Installed with pliers
in few minutes. Real dealer opportunity. Good
profits. Write. Exclusive distributors wanted.

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Stevens Tools

OVER 100 ACCURATE SHORT-CUTS
TO GOOD WILL AND PROFIT ~ ~
"Thru your jobber - his service is economy"
STEVENS & COMPANY
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KISSEL

The Custom Built Car



The Aristocrats of
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7 Models - Open and Closed
Distributors in principal
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Kissel Motor Car Co.
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3,000 Dealers Make Bigger Profits



It will pay you to investigate

GUARANTEED
18 MONTHS

COLE BATTERY SALES CORP. 2435-39 Indiana Ave.
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Chaneeze



Chain Tightener

The New Design helps it to Sell

The improved design of the Chaneeze Anti-Skid
Chain Tightener, besides tightening chain, prevent-
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thereby saving wear on tires to a noticeable extent
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The Welker-Hoops Mfg. Co., Middletown, Ct.



ELGIN QUALITY PISTON PINS

Regular, Oversize, Orphan
Shipped Same Day

ELGIN MACHINE WORKS

Elgin, Ill.

Kokomo

LONG-LIFE
TIRES AND TUBES

KOKOMO RUBBER CO., Kokomo, Indiana
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Kokomo Long Life tires and
tubes make money for deal-
ers who handle them.

Kokomo Twin-Grip Fabrics
Kokomo Two-Grip Cards
Kokomo Everlast Red Tubes
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Pulls Car Over Rough Spots

No friction—no springs—
no oiling. For Fords—solid Drop
Forging—\$24.00.

YORK ELECTRIC & MACHINE CO.
York, Pa.



Thirty-seven BRANCHES

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321 EAST TWENTY NINTH STREET, CHICAGO, ILLINOIS

"It pays to buy a Kellogg"

KELLOGG

COMPRESSORS

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Real High Tension Ignition for Ford Cars

Varley coils eliminate nearly all chronic ignition trouble. Save gas. Add power. Keep plugs clean. Stop misfiring. Save repairs. \$2.50 each. Write for full particulars.

The Autocoil Co., Jersey City, N. J.

BIGGER PROFITS FOR YOU NOW WITH NEW 8 HOUR BATTERY CHARGING

HB 8-Hour Constant Potential Battery Charging doubles your present income. Lowers charging cost, saves one-half on labor, one-half on rental batteries needed. Patented HB Voltage Regulator eliminates reversing. \$35 cash brings complete outfit. Your big monthly profits easily carry small payments. 30 days' free trial. Write for bulletin Hobart Bros. Co. Box AR 22, Troy, Ohio.



THE LOWEST-PRICED COMPLETE OUTFIT ON THE MARKET



The 100% Lubricants

Guaranteed not to cake or harden or to contain any Moisture, Mineral or Fatty Acids. Attractive proposition for Jobbers and Dealers.

RADIANT OIL CO., Inc.
Manufacturers and Compounders

Lima Ohio

REPAIRMEN

Here's a new source of profit!

Send us your rewind jobs. We are "Armature Winding Specialists."

Profit for you in our service. Ford generator armature rewind—\$1.95. Other prices in proportion. All work guaranteed. Write for catalog and prices on all generators.

H. M. FREDERICKS CO., Lock Haven, Pa., U. S. A.



NO-LEAK-O PISTON RINGS


Won't Leak Because They're Sealed With Oil

No-Leak-O Piston Rings are making money for dealers everywhere. Their "oilSEALING" groove—found only in No-Leak-O—picks an oil film in between piston and cylinder walls like "packing" in a pump. Oil and gas stay where they belong. National advertising is helping the dealer sell No-Leak-O.


it will pay you to stock No-Leak-O at once.

Price 35c and up

NO-LEAK-O PISTON RING CO., Dept. 376, Muskegon, Mich.




"The Best-Equipped Shop Gets the Business"




The AERMORE
Exhaust Horn

The Signal with a Smile

One of the fastest selling nationally advertised accessories on the market. Order from your jobber.



The "Big Four"

A complete car washing service.

RUBBER COVERED—IMPOSSIBLE TO INJURE CAR.

Used in connection with our Little Giant Water Savers, or can be applied to any 1/2 in. or 3/4 in. valve.

Rubber Nozzle—for full water flow.

Spray Nozzle—for general purposes.

Spout Nozzle—for cutting mud from fenders, etc.

Slot Nozzle—a sheet of water covering a large surface with force.


PRICE—Set of four Nozzles, \$2.00 less dealers discount

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After using Hall Hones for over one year Buick test out the New Hall Hone and approve of it. It is the only Hone endorsed by Buick.

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ACCURATELY DALL MACHINED

REPLACEMENT PISTONS


Semi-steel—for use after a rebore or re-grind job. Made to manufacturer's specifications. Made to pass motor builder's inspection. Standard sizes and oversize. Write for price list.

THE DALL MOTOR PARTS CO.,
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The MINUTE \$2.50 METER

Greatest clock value ever offered the trade. Accurate—handsome. Protected against vibration. Regulated without dismantling dash. Great seller. Price in Canada \$3.50.

The LINK CLOCK MANUFACTURING CO., Inc.
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ALL THE NAME IMPLIES

STEERING KNUCKLE BOLTS AND BUSHINGS
PISTON PINS, PISTON PIN SET SCREWS

Automotive Division
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Buffalo, N. Y.



Packard Cable

The Packard Electric Co.
Warren, Ohio




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Styles For All Cars



Gemo BUMPERS

Special Process Tempered Greater Cushioning Resiliency

GEMCO MFG. CO.
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The Broadcaster

A Department that will Find What You Want

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HOUSE OF A MILLION AUTO PARTS

THE LARGEST STOCK OF NEW AND USED CAR AND TRUCK PARTS IN THE WORLD. WE HAVE EVERYTHING.

New and Used Motors, Gears, Axles, Bearings, Springs, Magnets, Generators, Clutches, Starters, Universal Joints, Radiators, Cushions, Wheels (Wood, Disk, Wire), Carburetors, Piston Rings and Pins, etc.

Always mention model and serial number in order.

Write us. All inquiries answered promptly

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AUTO PARTS

SAVES 50% TO 75% ON ALL CARS

New and Used Gears—Springs and Axles—Cylinders—Motors—Rear Systems, etc. Wire or Write

INDIANA AUTO PARTS CO.
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LARGEST CAR WRECKERS IN INDIANA

ANY PART for ANY CAR NEW OR USED
Send for Catalogue
Cincinnati Auto Parts & Wrecking Co.
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Parts our middle name

AUTO Save 50 — 90% 2000 Models PARTS

NEW AND USED GEARS, AXLES, BEARINGS, SPRINGS, MAGNETS, GENERATORS, ETC. JOBBERS IN BANKRUPT AUTO SUPPLIES.

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DOWMETAL PISTONS

Lighter, stronger, and longer wearing than aluminum or iron. Can be fitted with bronze bushings in the wrist pin holes same as in iron pistons. Dowmetal has no permanent growth. The expansion is little more than iron.

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Refund will be made if all insertions ordered are not needed, the amount refunded being the difference between cost of insertions given and full amount paid.

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Displayed advertisements are sold by the inch. Rates will be furnished upon application.

The right is reserved to refuse any advertisement and also to rewrite and edit copy furnished whenever the publishers consider it advisable to do this.

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THE CLASS JOURNAL COMPANY

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644 G. Street, N. W., Washington, D. C.

MISCELLANEOUS

TO LET ON ROYALTY Sole Manufacturing License for mechanical windshield cleaner, single and double models. Fully protected by five Patents. Thoroughly perfected and tested. Smallest device, most powerful, noiseless and simple. Manufacturing cost less than 95c. Unique direct drive clutch connection fits 95 per cent of car models in circulation. Endorsed by car manufacturers as the ultimate standard equipment device. Great possibilities for proper concern. Only manufacturers having well established sales organizations considered. Address Box 6177, care Motor Age, 5 S. Wabash Ave., Chicago, Ill.

SELL YOUR OWN BRANDS

GREASES, Cements, Oils, etc., can be quickly put into collapsible tubes of tin or lead and prove a very profitable side-line. Dealers and jobbers buy in bulk and sell in tubes thus building up a large personal business. We can supply tubes either plain or decorated. Peerless Tube Company, 60 Locust Ave., Bloomfield, New Jersey.

WANTED—A specialty to manufacture and sell on a royalty basis, or permanent manufacturing arrangement with some live selling organization. We have large plant well equipped. Box 6165, care of Motor Age, 5 S. Wabash Ave., Chicago, Ill.

ADDRESS: FORD RIDEASY, 223 Grand Ave., W. Detroit, Michigan. Absolutely kills the chatter shocks and irons out the rocking rebounds.

MISCELLANEOUS

FOR SALE—Prosperous Garage in brick building on Dixie Highway in Illinois, with Chevrolet Agency. 125 cars sold in last four months. Well equipped shop and fine sales room. Handle a full line of tires, oil and accessories. Room for 60 cars in storage. Good reasons for selling. Address Box 6172, care Motor Age, 5 S. Wabash Ave., Chicago, Illinois.

"WILL TRADE OR SELL"

Prosperous automobile accessories and tire business located in one of the most progressive cities in Northern California. I want to go East. You may want to come West. Let's trade. Business is worth about \$40,000 and it's growing fast. What have you to trade? Address Box 6169, c/o Motor Age, 5 S. Wabash Ave., Chicago, Ill.

FOR SALE—Garage and Ford agency in Southwest. One hundred car contract, stock and equipment will invoice about \$15,000. Only three used cars, several of largest oil companies leasing and drilling in neighborhood, only cash deal considered. Box 6174 care Motor Age, 5 S. Wabash, Chicago, Ill.

MODERN FIRE PROOF GARAGE for sale to settle estate. On tourist route and main street of live Northern Minnesota City. Leased to reliable party for five years at seventy-five dollars per month. Price ten thousand dollars. Terms. Address Box 6176, care Motor Age, 5 So. Wabash Ave., Chicago, Ill.

We want a few more distributors and jobbers, also district salesman to handle NICKL-IT, a non-abrasive, renickeling and replating polish. Write us for our liberal proposition. Nickl-It Distributing Co., 20-22 South 15th St., Philadelphia Penna

FOR SALE—Garage 32x60, on Yellow Stone Trail. No opposition. Authorized Ford and Chevrolet Station. Stock, building, tools, \$3500. Have other interests. Address Box 6175 care Motor Age, 5 S. Wabash Ave., Chicago, Ill.

FOR SALE or royalty U. S. Patent applied. Ford rear fender, body and running board brace, very simple, attractive, two minutes to install. Frank Roemer, Union, Okla.

HELP WANTED

EXECUTIVE WANTED

COMPANY with \$250,000 assets, making specialties for several well-known automobile manufacturers has other devices of extreme importance ready to be marketed.

Wants business executive of high calibre and financial assistance to put the project on a very large scale. Excellent opportunity for right man.

Address Box 6178, c/o Motor Age, 5 S. Wabash Av., Chicago, Illinois

RADIASHIELD—\$10

The greatest of Metal Radiator Fronts

Rated Distributors and Distributing Salesmen wanted in every section. A year's income for three months' work.

RADIASHIELD, INC.
30 Church St., New York

SALESMEN WANTED TO ACT AS DISTRIBUTORS ON INCANDESCENT AUTOMOBILE BULBS. TO CARRY STOCK AND MAKE DELIVERIES FROM THEIR CARS. GOOD OPPORTUNITY. ADDRESS BOX 6155 CARE OF MOTOR AGE, 5 S. WABASH AVE, CHICAGO, ILL.

AGENTS

EXCLUSIVE AGENTS: WE HAVE AN AGENT IN EVERY TERRITORY TO SELL THE FAMOUS K-W ROAD SMOOTHERS, A COMBINED SHOCK ABSORBER AND SNUBBER FOR FORD CARS. SET OF FOUR SELLS TO CAR OWNER FOR \$20.00. WILL MAKE ARRANGEMENTS WITH RIGHT PARTY FOR EXCLUSIVE TERRITORY TO SELL FORD OWNERS, DEALERS AND GARAGES. SEND FOR LITERATURE AND WRITE US ALL ABOUT YOURSELF. THE K-W IGNITION CORPORATION, DEPARTMENT "B", CLEVELAND, OHIO.

Broadcaster Service Brings Together the Man With the Business Want and the Man Who Can Fill It.

Bosch

**Franchise Details for
Selling Genuine Bosch
Products Will Be Gladly
Sent to You Upon Request**

*Always look for the full
name "Robert Bosch"
and trade mark shown
below.*

ROBERT BOSCH MAGNETO Co., Inc.
OTTO HEINS, President
109 West 64th Street
New York

TRADE

MARK

- ✓ **Solid Bronze Backs**
- where bronze backs are used
- ✓ **100% Virgin Metal**
- ✓ **10 Times Tested**
in inspection
- ✓ **Clean, Solid Babbitt**
- no Blow Holes
- ✓ **Machine Finished**
both before and
after babbitting
- ✓ **Not Over**
a Day Away

You are bound to get the right bearings—every time—if you order from our handy, nationally used 68-page bearing guide, which lists practically every make of car, truck and tractor with Milwaukee Bearing stock numbers for each. Not-over-a-day-away from your shop is one of our 550 distributors, with a complete stock of the Milwaukee connecting rod and crankshaft bearings in sizes most in demand in your territory. Write for his name and free copy of bearing guide booklet.

Milwaukee Die Casting Co., Dept. F-9, Milwaukee, Wis

MILWAUKEE "Not Over a Day Away" **BEARINGS**

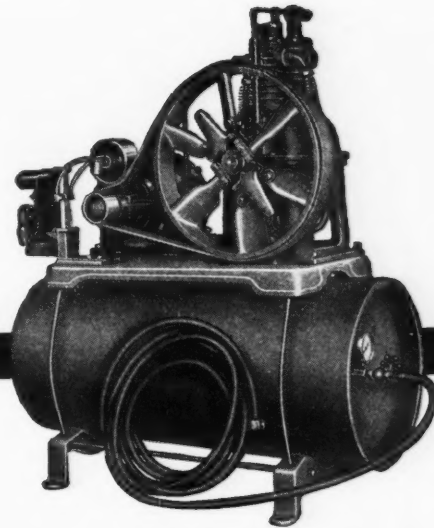
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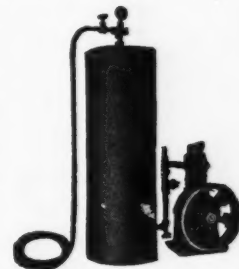


Real Air Service in This Curtis

THE above illustration is the Curtis Style V Two-stage Outfit—one of the family of popular Curtis Outfits—the last thing in air compressor design—free of complicated parts—built for hard usage and will be on the job all the time. $\frac{1}{4}$ to 3 H.P.—automatic.

Single and Two-stage Many Sizes and Styles

We manufacture a complete line of single and two-stage outfits. You are sure to find one that will meet your particular needs in style, size and price. Write at once for full information and descriptive literature. Use the coupon below, or a postcard will do.



Style "S" Single Stage Outfit. Belted only. Five sizes— $\frac{1}{4}$ to 3 H.P. motor required.

CURTIS PNEUMATIC MACHINERY CO.
1527 Kienlen Ave. St. Louis, Mo.

Branch Offices

530-H Hudson Terminal • New York City

USE THIS

AIR COMPRESSORS—HOISTS—TROLLEYS—CRANES

COUPON

CURTIS PNEUMATIC MACHINERY CO.

Established 1854

1527 Kienlen Ave., St. Louis, Mo.

Gentlemen: Please send me full details on Curtis Air Compressors—your proposition and prices.

Name.....

Address.....

Jobber's Name.....

Address.....

Stromberg Carburetor's Again Help To Make Another Worlds Record

Lieut. Maughan's sensational "dawn to dusk" flight across the continent, in a Curtiss Plane equipped with a Curtiss, D-12 Engine, was a record-smashing achievement of indomitable courage, and remarkable engine performance.



The essential requirements that made for success were---

Power and Speed, sufficient to carry the plane on its 3000 mile flight with the sun.

Durability and Stamina, to stand up under the severe strain of practically continuous flying.

Fuel Economy, that would safely carry the pilot over the long stretches between fuel stops, with no danger of forced descent at an unexpected moment on account of the exhaustion of fuel supply.

To meet these requirements, the Pilot and the Curtiss Engineers knew that the Carburetor, the very heart of the engine, must be right.

It was only natural then, that they should put their faith in the proved dependability of Stromberg Carburetors.

DEALERS--Take advantage of the prestige of Stromberg Carburetors. Dealers everywhere are making money with the Stromberg Line.

Why not YOU too. Write today for complete sales plan: Dept. 827-A

Built Special for Every Car

Carburetors for
Cars Trucks Tractors Airplanes Boats

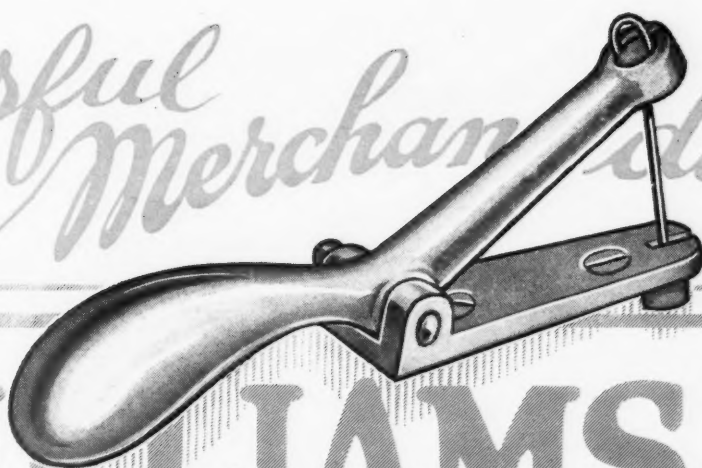
Stromberg Motor Devices Co.

58 East 25th Street
Chicago



Lieut. Russell L. Maughan standing beside the standard Curtiss Pursuit Plane, powered with a Curtiss D-12 Engine, in which he flew from New York to San Francisco in 21 hours, 40 minutes, including stops. His actual flying time was 18 hours, 20 minutes.

Successful Merchandise



WILLIAMS

AUTOMOTIVE PRODUCTS



You can sell a Williams Accelerator in less time and with less effort than any other Ford foot throttle made.

Three reasons for this:

1. Williams Accelerators offer greater dollar for dollar value than any other Ford foot throttle. You can easily prove this by comparing the Williams with any other Ford accelerator.
2. Williams Accelerators are sold completely assembled. Each Williams Accelerator is a complete working unit. You can easily demonstrate it with one hand.

3. Williams Accelerators are backed by sound continuous consumer advertising. Not just a flash in the pan. Williams advertising is everlastingly at it, plugging away at your customers with the Williams message.

If you don't carry Williams Accelerators, order a service stock today. If you are not pushing Williams Accelerators you are overlooking the money-making, confidence-creating possibilities that this quality merchandise holds.

Regular \$3.00

Junior \$1.50



WILLIAMS BROS. AIRCRAFT CORPORATION

25th and POTRERO AVENUE
SAN FRANCISCO, CALIFORNIA

WILLIAMS ACCELERATOR

for FORD CARS



This advertisement is one of a series appearing in *The Saturday Evening Post*, *The Country Gentleman*, *Successful Farming* and *The Farm Journal*. Jumbo reproductions of this advertisement have just recently been sent to National MAZDA auto lamp dealers.

**They Boost Your
Auto Lamp Sales**

THE Weekly Window News Posters and the Auto Lamp Kit Assortment complete for you the selling chain and make effective for you the magazine and billboard advertising of National MAZDA auto lamps. Get details from your National MAZDA auto lamp distributor or the Sales Division whose lamps you handle. National Lamp Works of General Electric Co., Nela Park, Cleveland, O.

**NATIONAL MAZDA
AUTO LAMPS**
A GENERAL ELECTRIC PRODUCT

